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HEART DISEASE AND PREGNANCY.<sup>1</sup>

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WHEN I promised to introduce this discussion from the medical aspect, I did not realize how difficult it would be to compress into a short introductory paper the many aspects of the subject. It is easy to lay down general rules, but the problem always presents itself to the practitioner in regard to a particular case and usually under one of three heads: (i) Should a particular woman, known to have organic valvular disease, marry. (ii) Should such a woman run the risks of pregnancy. (iii) If the woman be found to be pregnant, should the pregnancy be terminated.

To clarify discussion I propose to deal with these three points. It may be objected that in discussing the question of marriage I am going outside the subject set down for discussion, but even in these advanced days marriage is generally regarded as a desirable prelude to pregnancy and an occasional precursor of pregnancy.

In answering such questions each of us is apt to be guided by his individual experience. If we have once seen a disaster occur, we tend to take a gloomy view of all future cases that present themselves. On the other hand, if we turn to records we become confused in the battle of authorities.

The controversy was begun in 1877 by a paper by Angus McDonald in the *Journal of Obstetrics*. He collected twenty-eight cases of pregnancy occurring in patients with chronic valvular disease, of which 17 or 60% were fatal. This was quoted by Playfair,<sup>(1)</sup> whose book was the text book in midwifery in my student days, and this set the standard for many years. But, as I pointed out in a paper<sup>(2)</sup> to this Branch twenty-five years ago, such figures in the days when prenatal examinations were at a minimum, probably erred on the grave side in that they overlooked patients with mild organic disease, who passed unscathed through their pregnancy. Such lists also are futile in that they give us no idea of the relative severity of the lesion in different cases.

At the other extreme are the figures quoted in Fairbairn's "Text Book of Gynaecology and Obstetrics," collected by French and Hicks, of patients admitted to Guy's Hospital with mitral stenosis, that most dreaded of cardiac complications in pregnancy:

Out of 205 married women, in only 57 was there any direct relation between childbearing and the cardiac failure for which they were admitted to the hospital, and even among this number many had children without trouble, in one case as many as 12.<sup>(3)</sup>

There is a similar controversy as to which is the most serious form of valvular disease in relation to

pregnancy. Many regard mitral stenosis so seriously that they would forbid marriage to anyone affected with it. Mackenzie, on the other hand, regarded aortic lesions as more serious than mitral stenosis.

The difficulties that confront the physician are illustrated by the following case which recently came under notice:

Miss P., aged thirty, consulted me in April last. Because of recent headaches she had seen in succession an optician and an oculist. The latter, finding no defect in her vision to account for her headaches, advised her to see her family medical attendant. His examination revealed the signs of mitral stenosis in her heart and a diamond engagement ring on her finger. He therefore told her that he did not think she should get married. This was the first time that she knew or suspected that there was anything wrong with her heart. Another physician confirmed this opinion, but later an older consultant had taken the opposite view and said he saw no reason against marriage and even pregnancy. She therefore came to me for further opinion and after examination I agreed with the more favourable view.

This occurrence strikingly illustrates present differences in medical opinion and is the justification for the present discussion on what to some may be a time worn subject.

The reasons on which my conclusions were based, were:

1. The previous history of rheumatism with swollen wrists and hands at the age of seventeen without any subsequent recurrences.

2. The absence of any cardiac symptoms in a patient with a fourteen-year-old lesion, although she had lived a normal life and indulged freely in tennis and dancing.

3. Although there was a thrill present and a snapping first sound with a presystolic murmur, there was no evidence either by physical examination or X ray screening of any enlargement of the right side of the heart.

4. Testing with rapid walking and repeated mounting of a 22.5 centimetre (nine inch) step revealed very little increase in pulse rate, with a return to normal in less than a minute.

As regards marriage in such cases I do not think that any of us have the right to forbid marriage. All we should do is to explain the physical position frankly, give as fair an estimate of risks as we can, if possible see that both parties understand the position and leave the decision to them. In these days especially, many other considerations enter into the question of marriage besides that of pregnancy; the amount of extra physical strain apart from pregnancy varies tremendously, according to social position and other factors; the psychical as well as the physical is involved. I can recall at least two cases in recent years of girls with severe aortic regurgitation, in both of whom I should have spoken strongly against marriage had I been consulted. In the one case the wife died of cardiac failure after fifteen months; the other woman has lived and enjoyed life for ten years. In neither marriage was there any regret expressed on either side.

<sup>1</sup> Read at a meeting of the South Australian Branch of the British Medical Association on September 26, 1929.

In the particular patient under discussion there was no evidence of a progressive lesion; apart from pregnancy there was a reasonable prospect that, married or unmarried, she would live ten years in comfort. If invalidity from heart failure occurred then or at the menopause (the risks of which in such cases have been pointed out by several authorities), her downward progress would probably be fairly rapid. This being explained to her, she preferred the risk of marriage.

As regards pregnancy, the possible consequences to the heart were explained, with the difficulty of saying what in her particular case would be the actual effect. The necessity was emphasized for medical supervision if pregnancy did take place.

But I recognize that others might not agree with this position. Although most recent authorities agree that mitral stenosis is not an insuperable bar to marriage, many practitioners would still ban marriage in any patient with signs of that lesion. Their prohibition would be all the more emphatic in regard to pregnancy. In certain quarters this view has gained strength in recent years because of the emphasis that has been laid on pure mitral stenosis steadily progressing to a button-hole orifice. But in my personal experience most, if not all, such lesions are in recent immigrants from England. Just as other rheumatic infections are milder in this State, so I think we see more of the stationary lesions in which, as Vaquez says, the breakdown comes from external causes. Is pregnancy invariably such an external cause? Most of us can point to patients with mitral stenosis who have safely borne one or two children. At the present time there is in my ward a woman with a history of mitral stenosis dating from before her marriage at nineteen years of age. She has a child seventeen years of age and has just successfully passed through a severe attack of pneumonia.

In any case this fixation of all the emphasis on the valve affected and on the particular kind of lesion is in my opinion quite wrong. We know that even in patients with apparently normal hearts we occasionally see the heart break down in the later months of pregnancy. I gave instances of this in my previous paper and in a recent investigation to which Dr. Brian Swift will refer at greater length, Dr. Gammeltoft, of Copenhagen,<sup>(4)</sup> puts the proportion of such circulatory breakdowns in 239 healthy pregnant women as one in seven. He adds that many of these patients, if seen in the last two months of pregnancy only, could not be distinguished from patients with organic heart disease; the true position is made clear only by the complete recovery that takes place after delivery. It will be noted that this proportion, one in seven, is as high as that in a series of ninety-eight cases of pregnancy in chronic valvular disease, quoted by Comyns Berkeley.<sup>(5)</sup>

The important point in every case of pregnancy, therefore, is the condition of the myocardium. Much controversy has taken place on the question of the

hypertrophy of the heart in pregnancy. We were taught it as a fact in my student days, later McKenzie called it a "barren and academic question." Vaquez<sup>(6)</sup> states that in his investigation of cases in which cardiac hypertrophy was ascribed to pregnancy, he found no case which could not be due to other causes. Later, radiologists maintained that dilatation rather than hypertrophy occurred and recently in the investigation above referred to Gammeltoft concludes that hypertrophy of the left side of the heart occurs in early months and of the right side in later months and that "the heart action is increased in pregnancy as a result of the increased total amount of the blood and the increased minute volume."

In any case we are driven back to consider the myocardium or what we call cardiac reserve. "When the heart of the dog is isolated and disposed in such a manner that the blood entering the right side of the heart is ejected by the left ventricle against a measurable and variable resistance (the heart-lung preparation of the late Professor Starling) it is possible to vary at will the amount of work performed by it. As the heart tires under a constant load or if it is given more work to do, it dilates and we speak of this dilatation as an indication of partial failure." Its "tone" is diminished and its functional reserves are dwindling. If we think of the symptoms where cardiac breakdown does occur in pregnancy, we realize that in nearly all cases these are due to cardiac dilatation, which means that the particular muscular function that is at fault is not conductivity or rhythmicity or contractility, but that of tone, again emphasizing the importance of the state of the cardiac muscle and its reserve power.

In any case, therefore, where the question of pregnancy arises, an old standing valvular lesion is simply of importance in that it has already necessitated more or less hypertrophy of a certain part of the cardiac musculature and to that extent has lessened the cardiac reserve. The extra work demanded of such a heart during the later months of pregnancy may be just enough to upset the equilibrium that has been established. This, too, explains why mitral stenosis needs more careful consideration than aortic lesions; the margin of reserve in a hypertrophied left auricle is less than that in a hypertrophied left ventricle with the undamaged left auricle still in reserve and this becomes still more manifest, if, as Gammeltoft says, even in normal hearts in the later months of pregnancy the right side of the heart becomes hypertrophied. But in any case it is the condition of the muscle rather than of the valve that is of supreme importance.

As Mackenzie<sup>(7)</sup> stated:

The valve lesion in the great majority of cases is at the most only an embarrassment to the heart, and one which it can easily overcome. The presence of the lesion is important, however, in another respect, namely, in that it calls attention to the heart and serves to remind us that the disease that injured the valve may at the same



time have injured the muscle. Our object in examining these cases is to find out the extent of the lesion in the muscle. The essential question in a case of valve disease is the condition of the muscle, and this is determined by the manner in which the heart responds to effort.

In my paper of twenty-five years ago I wrote:

Undoubtedly the most important points for prognosis are, as in all cases of chronic cardiac trouble, the state of the muscular wall and the amount of enlargement of the heart present . . . . Other considerations that have to be weighed are the nearness in point of time of the causal disease, the social condition of the patient and the number of the pregnancy.

And what has depressed me in writing this paper is the realization that with all the advances in cardiology in the last quarter of a century we are little more able to measure in any given case the reserve muscular power of a particular heart than we were then.

If a patient, therefore, has at any time past, whether from previous pregnancy or other causes, shown evidence of cardiac failure, we should utter the strongest warning against any subsequent pregnancy unless there were very particular circumstances to explain that failure. For such past failure is direct evidence of muscular weakness and deficiency of cardiac reserve. If, on the other hand, there is no such history, the patient with a chronic valvular lesion should be given severe muscular tests and the response to effort should be estimated and judgement given accordingly. In such cases also due allowance must be made for other personal factors, such as the pelvic and renal conditions, the social circumstances of the patient, the opportunities for leisure and rest, the temperament, willingness to submit to discipline and so on. Such a patient should be warned also as to the special necessity for careful and continuous supervision if pregnancy does ensue. It should not be necessary for me to add that both on this question and the question of marriage none of us should take the responsibility of passing a definite opinion without the most thorough examination and conference with a colleague.

This brings us to the third question: If pregnancy has occurred, should it be terminated? In the early months what I have already said still holds true. I have on several occasions been asked for an opinion in such circumstances and where there have been no symptoms of cardiac embarrassment and response to effort has been good, I have never regretted recommending the pregnancy to be allowed to proceed, provided that the rules of life laid down are followed and careful supervision maintained.

In the later months, when the child is viable, the opinion of the obstetrician who is to follow in this discussion, will be more valuable, for here the question turns chiefly on the method of induction to be employed. It is in those middle months that decision is specially difficult, when the patient is half way through the stormy passage, when the child is not yet viable and when induction of labour probably involves more difficulty than earlier or later in the

pregnancy. I am one of those who hold that for many reasons termination of labour before the child is viable should never be lightly agreed to and it is this particular class of patient that always gives me the most thought when endeavouring to come to the right conclusion. It is an unwritten rule never to terminate pregnancy without a second opinion; in these cases I think three heads are better than one.

The following patient, seen recently, illustrates these difficulties and also reemphasizes my previous points. For this patient had no valvular lesions, but had had a slight cardiac breakdown two years previously.

Mrs. E.H., aged forty-two, was in my ward in October, 1927, complaining of fairly constant pain in the back, headaches, dizziness and recent shortness of breath. She was admitted because of an attack of epistaxis which had led to the discovery of a high blood pressure. Her history showed that she had had kidney trouble with her first baby twenty-two years previously; she had been pregnant fourteen times; each confinement had occurred at the seventh month of pregnancy; several of the children had been stillborn; eight children were dead. She had heart failure with swelling of the feet and shortness of breath at the end of one pregnancy. She was thin, edentulous, her pulse rate was 96, her systolic blood pressure was 260 and her diastolic pressure 150 millimetres of mercury; respirations numbered 20. The beat was in the sixth space ten centimetres (four inches) from the mid-sternal line, with a soft systolic murmur at the base and an accentuated second sound. The specific gravity of the urine was 1020; it contained no albumin. The Wassermann test applied to the blood yielded no reaction. The blood urea percentage was 1.5, 1.3 and 2.2 respectively. With rest in bed her blood pressure came down and her immediate symptoms were relieved. Venesection and withdrawal of three hundred cubic centimetres (ten ounces) of blood were followed by a further fall of the systolic and diastolic blood pressure to 205 and 120 millimetres of mercury respectively and she was allowed to go home with directions as to rest and restricted diet. In June this year she returned, about four and a half months pregnant, having felt movements of child a few days previously. She stated that she had kept fairly well till some two months previously, when vomiting had begun. Her urinary findings were the same as previously, the blood urea was fifteen milligrammes per hundred cubic centimetres. Urea concentration test gave figures of 1.7%, 1.9% and 2.3% respectively. Phenol-sulphonphthalein test showed that 38% of the dye injected was excreted in the first hour and 41% in the second hour.

On the other hand, the pulse rate was 116 on admission, with extra systoles; her apex beat was a little further out; the systolic blood pressure was 216 and the diastolic pressure 156 millimetres of mercury and a systolic murmur in the tricuspid area was noted.

It was evident that the functional condition of her kidney was unchanged; apparently she had a scarred kidney from her original pregnancy with very little progressive change. On the other hand, the lessened pulse pressure, rapid heart and tricuspid murmur showed that the heart was breaking down under the increased strain of pregnancy. The question of termination of pregnancy was discussed with two obstetricians. On the one hand were these symptoms, on the other she was in the worst period in which to induce labour and there was the fact of all previous pregnancies terminating naturally at the seventh month. With rest and light diet and without medication her condition improved, her urine increasing from 540 cubic centimetres (eighteen ounces) in the first twenty-four hours after admission to 2.4 litres (forty ounces) three weeks later; in the same period her pulse rate came down to 86. On this account it was decided to watch her for another fortnight and she was allowed home with strict instructions to rest. She returned a week



later with breathlessness and cyanosis and nocturnal orthopnea. Her apex beat was much further out and her pulse rate running from 100 to 120. Not only had her heart further dilated, but rest even with digitalis did not improve her. Labour came on naturally a few days after readmission and fetus and placenta were delivered naturally a few hours later. She lost a good deal of blood and sank and died shortly after delivery.

Questions regarding delivery and treatment after delivery I leave to the obstetrician who is to contribute to this discussion, merely humbly suggesting that just as a physician calls in the obstetrician when the question of inducing labour arises, so the obstetrician might call in the physician when after delivery the question of cardiac failure or transfusion arises.

While I have thus far emphasized the importance of muscle tone in estimating the risks of pregnancy in chronic valvular disease, there is one point connected with the valves which is of great interest.

Angus McDonald in his original paper in 1877 laid stress on the possibility of a fresh infection of diseased valves arising during the course of pregnancy.

Until this year I had not seen such a case. They must be rare and I do not know how one can estimate beforehand the risks of their occurrence. But such cases should be recorded and Dr. Drever, of Angaston, who asked me to see this patient with him in July, has kindly consented to my reading these notes.

The patient was a *primipara*, aged twenty-six years, who, when first seen by Dr. Drever, was about four and a half months pregnant. There was no previous knowledge of the existence of valvular disease. About three weeks previously she had come on a holiday visit to Adelaide and for the last ten days of her stay she had been in bed with a daily afternoon temperature of about 37.8° C. (100° F.). The medical man who attended her during that time, told me subsequently to my seeing her that she had a mitral presystolic murmur when he examined her then, but he could find nothing to account for her fever and did not relate it to her cardiac condition. She returned home and for the next week complained of hot and cold feelings. Dr. Drever saw her first on June 23 on this account and in addition to her pregnant uterus and the presystolic murmur, found her temperature 37.8° C. (100° F.), the respiration rate 26, pulse rate 100 and pus cells in a catheter specimen of urine. This was naturally thought to be due to a pyelitis of pregnancy. Next day she had a definite rigor and temperature of 38.9° C. (102° F.) with some moist râles at both bases and was ordered into hospital. On June 26 a more marked rigor occurred and a blowing systolic murmur was noted. On June 27 her highest temperature was 38.2° C. (100.8° F.), but she was delirious, with some stiffness of the neck suggestive of meningeal irritation, the left pupil was dilated and increased deep reflexes were present in both left arm and leg, with Babinski's sign on that side. A catheter specimen of urine this day contained no pus.

When I saw her on the evening of June 28, her temperature was normal (after being 38.5° C. or 101° F. earlier in the day), her pulse rate 120 per minute, her respiratory rate 24. She looked very ill, was semiconscious, answering simple questions rationally, but incapable of giving any connected history and wandering off into unconnected remarks. Her pupils were semidilated and equal, there was no ocular paralysis, but quite definite paresis of the left arm, most marked in the fingers and hand, slighter paresis of the left side of the face only, with increased deep reflexes on that side, but a flexor plantar response.

Blood examination done earlier in the day revealed a red count of 2,500,000 and a white count of 30,000 per

cubic millimetre. The cardiac dulness was not enlarged, the apex beat was forcible, a thrill was present at the apex, the sounds were regular, the first sound snappy with a definite presystolic murmur and a harsh systolic murmur. The only diagnosis possible to explain this history and signs with such definite hæmolytic and leucocytosis was a fresh bacterial infection supervening on an old mitral stenosis with emboli first in the kidney and later in the brain. An attempt was made to secure a blood culture, but there was no growth. A very bad prognosis was given. Apart from the probably progressive nature of the heart lesion, it seemed probable that the cerebral embolus was infective. It did not seem any use terminating pregnancy and to do so was only throwing additional strain on an already labouring and infected heart. Antistreptococcal serum injections had been started and these were continued with the addition later of an antitoxic serum.

Dr. Drever's notes of subsequent progress are as follows:

She went the following four days without any rise of temperature or rigors which left her much exhausted. By July 7 her pulse rate was 110 to 120, her erythrocyte count was 1,750,000 and leucocyte count 6,500 per cubic millimetre; in the rigors her pulse went up to 130 to 140 and her respiratory rate to 40. Her head signs and her cerebral condition remained much the same. On July 9, following a severe rigor, she had a miscarriage and the uterus was completely emptied without assistance. She lost a good deal of blood, but her erythrocyte count was 2,200,000 and leucocyte count 7,000 per cubic millimetre. The systolic blood pressure was 100 and the diastolic pressure 60 millimetres of mercury and her pulse had become small and rapid, 146 per minute. On July 10 there was another rigor, except for which her temperature was much lower for the two days following the miscarriage. It then gradually rose and for the next eight days she had a temperature swinging every day to 39.4° C. (103° F.), but without rigors until July 19, when there was another slight rigor and she complained of severe pain in the left leg. Her heart signs had remained about the same, but at this time she showed marked general exhaustion, the pulse being feeble and always over 100 per minute. The paresthesia had improved, but she was sleepless, in spite of hypnotics and morphine being tried in succession. On July 23 the erythrocytes numbered 2,800,000 and the leucocytes 13,500 per cubic millimetre and the patient became maniacal and very sleepless. Lumbar puncture was performed and clear fluid obtained under normal pressure, but without relief to the patient's restlessness. From July 3 to August 1 the patient remained about the same, the temperature rising to 38.3° C. (101° F.) and the pulse rate remaining about 120. She seldom spoke coherently but still took some nourishment. She was very sleepless in spite of different hypnotics given at regular intervals. The murmur at the apex beat was now very pronounced and distinctly transmitted over the chest. On and after August 1 the patient's temperature was normal. Hypnotics were still persisted with for another seven days, the patient showing improvement in mentality till August 20, when she was allowed to sit up without any alterations to temperature, pulse or respiration. From this onwards convalescence has been uneventful. The murmur is now distinctly heard over the left side of the chest, but no cardiac dilatation is present and the mental state is good. The blood count has not since been done, but the patient does not appear to be anæmic. The period from when first seen to the time of discharge from hospital was eleven weeks.

It is difficult to explain this case. The symptoms could not be due to emboli dislodged from the auricles as described by Vaquez, because that would not explain the pyrexia, rigors and leucocytosis. If it were a true bacterial endocarditis, the recovery is unusual. In any case the dramatic and unexpected effect of the termination of pregnancy is noteworthy and a guide for treatment in similar cases.

## Addendum.

Since reading this paper I have (October 4) seen this patient at my rooms. Except for a slight weakness of the left arm and leg, she is apparently in perfect health, both mentally and physically. Facial paresis has quite disappeared. The pulse rate is 80, the apex beat is palpable in the fifth left intercostal space about 6.25 centimetres (two and a half inches) from the mid-sternal line. The cardiac dullness is not increased. No thrill is present. A snappy first sound merges into a systolic murmur, but there is no presystolic murmur and screenings with X rays revealed no pronounced enlargement of the cardiac shadow.

## References.

- <sup>(1)</sup> Playfair: "The Science and Practice of Midwifery," 1889, Volume I, page 257.
- <sup>(2)</sup> F. S. Hone: "Heart Disease and Pregnancy," *Australasian Medical Gazette*, October 20, 1904, page 520.
- <sup>(3)</sup> John S. Fairbairn: "Gynaecology and Obstetrics," page 194.
- <sup>(4)</sup> S. A. Gammeltoft: "Heart in Pregnancy," *Surgery, Gynecology and Obstetrics*, March, 1928, page 382.
- <sup>(5)</sup> "Midwifery by Ten Writers," 1925, page 224.
- <sup>(6)</sup> Vaquez: "Diseases of the Heart," page 619.
- <sup>(7)</sup> J. Mackenzie: "Diseases of the Heart," 1908, page 249.

PREGNANCY AND HEART DISEASE.<sup>1</sup>

By W. A. VERCO, M.B., B.S. (Adelaide), F.C.S.A.,  
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WHEN one looks back over the last forty years, one can recall cases of pregnancy in women with aortic regurgitation, mitral stenosis and mitral regurgitation, in whom, in spite of fear of a catastrophe and anxiety for the safety of the mother, everything has run a normal course during the pregnancy and labour and during the lying-in period. On the contrary, one can also bring to mind other poor women who were in dire trouble and distress. The superadded pregnancy seemed too much for the damaged heart and one had to help them in their affliction, first by rest and medication and, if that failed to assist them, then by terminating their pregnancy. After the termination of the pregnant condition the circulation generally, but not always, reestablished itself and the patient was gradually restored to a measure of comfortable health again. One has also seen acute oedema of the lungs occur in these patients, though this condition in my experience has always been associated with albuminuria as well, and generally with old kidney trouble. Fortunately, one does not often see cardiac breakdown during pregnancy. This no doubt is due to the fact that pregnancy generally occurs during the vigorous period of life. Cardiac failure, on the other hand, generally occurs during the degenerative period of life, when a woman's muscular system has passed its meridian in tone and strength.

As to the frequency of cardiac failure in pregnant women, in different clinics it has a varying proportion, from 0.307% to 2.44%. In a total of 123,246 deliveries which I have collected, there have been 1,071 cases of heart trouble, giving a combined percentage of 0.8. The percentage of patients with

cardiac breakdown would appear to depend to a great extent on the woman's environment and living conditions. If with a cardiac or valvular defect the pregnant woman is hard worked, underfed and perhaps with family worries or employed industrially far into pregnancy, she is more likely to have a cardiac breakdown under the superadded weight of the parturient condition.

The mortality rate in 788 of these cardiac patients among pregnant women works out at little over 0.2%. In the Royal Dundee Infirmary there were 101 patients with heart conditions and thirteen deaths, a 1.28% mortality. If these are added to the other collected cases, it will make 889 patients with a 0.3% mortality.

The order of frequency of the various cardiac defects in a large number of patients from the different clinics proves to be: (i) Mitral regurgitation, 596 cases; (ii) combined mitral conditions, 320; (iii) mitral stenosis, 77; (iv) combined aortic and mitral conditions, 48; (v) aortic regurgitation, 18; (vi) aortic stenosis, 9.

In mitral stenosis the cardiac breakdown seems to be proportionately more frequent, more severe and accompanied by a heavier mortality. Among these patients at Guy's Hospital the death rate amounted to 13.9% and the abortion rate to 5.5%. You will notice that the cardiac mortality percentage is much greater in mitral stenosis than in ordinary cardiac failure, being approximately seven times greater. The abortion rate is also somewhat higher.

When the clinical history of these patients is viewed, there is no doubt that a large proportion of women with heart lesions pass through pregnancy without the knowledge, either by themselves or by their medical attendant, that they have a damaged heart. Fellner states that unless the pregnant woman is systematically examined, the lesion of only about one in seven is discovered. In the majority of the patients whose lesion is discovered, compensation is well established and these women will probably go through the ordeal of pregnancy and labour without any signs of cardiac embarrassment. If a woman's heart has shown no sign of inefficiency before pregnancy, she may as a general rule expect to pass through her carrying period and labour without any serious trouble from her heart. On the other hand, the position is quite different when the efficiency of a damaged heart is in a precarious condition. Pregnancy and labour then bring a superadded burden and risk which may prove too big a handicap for the defective heart.

The management of the heart patient during pregnancy to a great extent resolves itself into the management of the heart condition. If there is cardiac failure, as evidenced by dyspnoea on exertion, oedema of the legs or oedema of the lungs, the patient should be kept in bed at rest and suitable medical treatment should be instituted. Food should be light, nourishing and easily digestible. If necessary, sleep may be induced by suitable drugs

<sup>1</sup> Read at a meeting of the South Australian Branch of the British Medical Association on September 26, 1929.

given internally or subcutaneously. Venesection may be advantageous in certain instances. In milder cases in which the cardiac muscle is showing signs of weakness, graduated exercises may be useful and the common internal disturbances incidental to the pregnant condition should be attended to. The quantity and quality of the urine should be watched and if necessary its secretion further encouraged by the necessary drugs. When the heart fails to respond to rest, medicinal and dietetic treatment, there will have to come into serious consideration the question of the desirability of terminating the pregnancy and so of lessening the strain on the mother's heart. For the unborn child the outlook in these desperate cases is unfortunate.

It is desirable that the induction of labour should be decided on: (i) When orthopnoea has supervened; (ii) in mitral stenosis, when oedema of the lungs tends to persist or when the heart rate is persistently over 100 and when palpitation supervenes on the slightest effort; (iii) in aortic regurgitation with a Corrigan's pulse or with a distinct forcible apex beat outside the mid-sternal line.

The question as to the advisability of the induction of labour is better decided at a consultation with another medical man. When induction of labour has been decided on, the method of election, if there be any urgency, is tapping the amnion between the membranes and the uterine wall and drawing off some of the amniotic fluid. This will nearly always insure delivery within twenty-four hours.

The special risks in this class of patient during and after labour arise from the sudden changes in the blood pressure and also from the fatigue due to the exhausting and strenuous work. In most instances in an endeavour to lessen the fatigue and lessen the amplitude of the excursions of the blood pressure, the labour may be terminated by the use of forceps as soon as the passages are ready for an easy dilatation. This will considerably lessen the prolonged exertions on the part of the patient and lessen the strain on the damaged heart. Ether anaesthesia may be used, unless there is any tendency to oedema of the lungs, in which circumstance mild chloroform anaesthesia may be better. Morphine and hyoscine may be used during the labour to lessen exhaustion.

*Post partum* hæmorrhage is severe in a number of these cardiac patients and has an unfavourable influence in increasing the tendency to collapse which to a certain extent may be already present. It may be advisable to anticipate such an occurrence by the subcutaneous injection of pituitrin or "Ernutin."

In these cases of cardiac failure there is a tendency for the labour to come on prematurely more often than in ordinary pregnant conditions.

In cases of cardiac breakdown, the anxiety is not all over at the birth of the baby and the expulsion of the afterbirth. Unfortunately there will be a certain proportion of deaths during the five or

seven days after delivery. The effects of the undue muscular exertion, the altered condition of the blood pressure and the alteration in the intraabdominal pressure impose new difficulties on the labouring heart. To counteract these difficulties, digitalis and stimulating medicines may be given to strengthen the heart muscle. The change in the intraabdominal pressure may be met by putting a 1.3 to 1.8 kilogram (three to four pound) sand bag on the upper part of the abdomen. The question of lactation will depend on the condition of the mother. She may be so ill that lactation is altogether out of the question.

Another inquiry that may and will often arise with this type of patient is: Should the heart patient marry and bear children? The answer is that the woman with a heart lesion whose compensation is fully established and is fully efficient, may marry and also bear children. On the other hand, the woman who is liable to attacks of heart failure, should avoid pregnancy. If such a person becomes pregnant, it will probably be necessary for her uterus to be emptied in an endeavour to save her life.

The old aphorism in heart affected women: "Maid do not marry, wife do not carry, mother do not suckle," must certainly be modified or abandoned in the light of recent and careful investigation.

In conclusion one may repeat the statement of Sir James MacKenzie, that pregnancy should be forbidden:

1. If the cardiac response is distinctly limited and palpitation readily induced by exertion.
2. On the appearance of dilatation, oedema of the legs or lungs.
3. In mitral stenosis with a diastolic murmur.
4. In aortic lesions, unless the muscle is good and intact.

Pregnancy may be undertaken:

1. When there are a fair field of cardiac response and no enlargement.
2. If there is a good recovery from heart failure.
3. In mitral stenosis with only a presystolic murmur and good effective muscle.

#### AVIATION. FROM ITS MEDICAL ASPECT.<sup>1</sup>

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Wing Commander, Deputy Director of Medical Services,  
Royal Australian Air Force.

No paper on aviation medicine would be complete without an appreciation of the work of Graeme Anderson, Flack, Clements, Bauer, Garsaux and the many others who did the pioneer work upon which depends the foundation of our knowledge.

The time at our disposal can be best used by referring briefly to the qualities demanded of the modern pilot and to some of the more interesting cases that have been reviewed in Australia.

<sup>1</sup>Read before the Section of Naval, Military and Air Medicine and Surgery of the Australasian Medical Congress (British Medical Association), Sydney, 1929.



What are the physical and mental qualities of a good pilot? Is there a type, a pattern? As a general principle, the man who is successful in sport, will be successful in flying. Sound nervous system, steady hands, keen eyesight, good judgement are the qualities required. To go into psychology in detail would be beyond the limits of this paper. That would involve the particular nature of the flying, for example, aerial combat, commercial aviation.

The international standards for commercial flying, as for the air forces of all nations are fairly uniform and may be summarized briefly.

1. A good family and personal history with particular reference to nervous stability.

2. There must be no surgical abnormality which might cause sudden illness in the air, such as hernia, renal or biliary calculus.

3. The heart, lungs, nervous system and kidneys must be normal.

4. There must be no active signs of syphilis.

5. Eyes. Vision must be 100% in each eye without glasses. The ocular poise, field of vision of each eye and colour perception must be normal.

6. Ears. The middle ear must be healthy. Auditory acuity must be 100%. The vestibular mechanism must be intact, not hypersensitive and equal on both sides.

7. Nose, throat and mouth. There must be free Eustachian tubal air entry on both sides.

International regulations provide for the examination of applicants for civilian flying licences by medical men specially designated by the contracting State issuing the licences.

There are two classes of licence issued. Class A, private licences which do not entitle the holders to carry passengers or goods for reward; Class B, commercial licences which do entitle the holders to carry passengers and goods for monetary consideration.

The system adopted in Australia in either case is for the applicant to be examined in his own State and the record of the examination to be sent to the medical assessor on a special form. The assessor advises the Controller of Civil Aviation of the medical fitness or otherwise of the candidate.

I hold the opinion strongly and have frequently expressed it, that this duty of assessing, especially when doubt exists, should rest with a medical board and not with an individual as at present, but there are practical difficulties in the way.

#### Nervous System.

Nervous stability is of supreme importance, yet at a single examination it is difficult to determine, especially as the candidate is sometimes desirous not to disclose any instability. The pulse is, perhaps, the surest guide, but one must be continually on guard for the neurasthenic, as this record reveals.

H., an ex-war pilot, was examined for a Class B licence. His pulse rate in the sitting position was 95, when standing 120, after exercise 132, settling down to 110 after forty seconds. There was tremor of the fingers. Otherwise he was a normal, capable-looking subject.

Another medical man on another day found the pulse slow and no tremors and was prepared to pass him. Yet his Australian Imperial Force history showed a distinct neurasthenia, in face of which it would have been a danger to give him a licence.

In this connexion a look-out needs always to be kept for minor epilepsy. The occurrence of this disease in individuals of even outstanding ability and the fact that the subject is sometimes quite unaware of the nature of the complaint, regarding the attack as of little importance, makes it necessary to inquire carefully into any history of "faints." Such an attack in the air might be fatal.

#### Auditory Apparatus.

In regard to the ears the regulation reads: "... Vestibular mechanism must be intact, not hypersensitive, and equal on both sides."

Case C, the hypersensitive. A youth, *etatis* eighteen, of splendid physique, captain of his school football team, champion boxer of his school for weight, seemed fit in every particular, yet his semicircular canals were so sensitive that he was sick every time he went up in an aeroplane. In a Bárány chair the duration of nystagmus after turning is unduly long and very little turning produces vomiting.

We are all familiar with the people who are seasick for the whole of a long voyage.

These very sensitive persons, once they get over the initial nausea, may make very good pilots; yet in the stage of getting over the trouble there is a great element of danger and some never get over it. The danger is that in a spin in the air, such an individual would be subject to such vertigo and vomiting as to render him quite unfit to control the aeroplane. The spin would then continue into the ground.

#### Defective Cochlear Apparatus and Labyrinth.

Case B. "Normal except for almost total absence of responses from left cochlea and labyrinth. There is no disturbance of equilibrium, as compensation is complete."

Upon that report he was rejected for a licence, but another examiner conversant with the regulations reported eighteen months later: "Left ear can hear a whisper at ten feet readily (which is within the regulations) and middle ear and vestibular mechanism normal." In view of the previous report, he was, however, again rejected.

The candidate came to Melbourne and was again examined by a specialist in otology who reported: "Left hearing is defective due to some cochlear change... Eustachian tube is patent. Right ear and hearing are normal. He does not comply with the standard in that left hearing is below whisper at one metre. His vestibular reactions to rotation are equal and within normal limits. In spite of his unilateral deafness I consider him fit to fly an aeroplane."

It is interesting to note that the "dead labyrinth" was passed undetected by the Bárány chair test, but was detected by the caloric test.

This man did fly an aeroplane and spinning into the ground was killed. The accident was similar in all respects to ten others in which there was no suspicion of any abnormality of the auditory functions. This is the commonest type of serious accident. The machine is stalled at a low altitude, goes into a spin and has not sufficient height to get out of the spin before reaching the ground. The opinion has since been expressed that the subject had had an

*encephalitis lethargica* in 1922 which may have affected his mental judgement in addition to causing a lesion of the eighth nerve nuclei.

I cannot place it officially before you, but those accidents are now the subject of careful investigation and it may be established that they were due not to defects in the machines nor to any physical failure of the human factor. Certain safety devices which are now part of the standard machines (slotted wings) will prevent this type of accident.

It must be remembered that in cloud flying a man may get into a spin, come out of the spin and if he relies on the evidence of his semicircular canals, he will not know he is out of the spin. He must under the circumstances rely on his instruments.

#### Colour Vision.

One of the difficulties frequently encountered by the examiner is partial colour blindness. The best test is the Edridge-Green lantern. "With this instrument three red glasses placed one behind the other, giving deeper and deeper shades of red, are seen by the subject. Similarly green glasses are used. If under these circumstances the subject calls red green or green red he is dangerous and must be rejected for service or commercial flying" (Clements). This will involve the rejection of quite a number of very able and otherwise fit men. Here it may be of interest to note that three successful Australian war pilots have been subsequently found to be colour blind.

For night flying the use of red and green wing tip navigating lights renders normal colour vision essential. For this reason it is necessary that all service pilots must possess normal colour vision and that the most careful tests be applied.

#### Exophoria.

The most interesting patient with exophoria I have examined was a war pilot who before the war played first class lacrosse, who learned to fly successfully and after having flown well began to make bad landings. He was compelled to discontinue flying owing to his bad judgement on landing. He writes himself: "I learned to fly in a comparatively short period, two and a half hours' dual; never had trouble in the air; landing was my weak point, calling for absolute concentration on every occasion; I had so much trouble in this respect that I would glance at the ground on one side and then on the other every two or three seconds in the final stages of landing so as to more accurately judge the height above the ground."

After returning from the war he again attempted to play lacrosse, but found that when attempting to catch the ball in his racket he would seem to judge its flight successfully up to within about twenty feet, but then his ocular judgement failed and he would not succeed in catching the ball.

On examination he was found to have  $\frac{6}{8}$  vision in each eye and apparently good binocular vision.

There was present a little exophthalmos, but a marked exophoria,  $20^\circ$ , and very poor convergence, in fact there was a concealed tendency to divergence. The only evidence of Graves's disease was the slight exophthalmos. With the Bishop-Harman diaphragm his ocular poise was found to be 12.

The case is interesting as showing how with normal vision in each eye and no apparent squint a man may yet be quite unfit for flying. A history of a blow in childhood just beneath the right eye, fracturing the bone, explains the ocular muscle imbalance.

Much research work has been carried out by Cecil Clements on this subject.

Two simple tests have been devised which will detect such visual defects, the convergence test and the cover test. Good convergence is to within five centimetres (two inches) of the eyes. The average is to seven and a half centimetres (three inches). Any reading greater than seven and a half centimetres (three inches) calls for careful investigation.

The cover test is detailed in the *Royal Air Force Manual for Medical Officers* as follows:

Ask the subject to fix a pencil held about eighteen inches from the eyes of the case under examination and with the free hand cover one eye by means of a card. Direct him to follow the pencil as it is moved from side to side in an even plane at a moderate rate. Finally bring it to rest accurately between the two eyes and, removing the cover, observe the result of these actions on this eye. Repeat the test on the other side.

The cover test gives an estimate of the prevailing conditions of binocular fixation. A perfectly balanced pair of eyes will remain fixed on the pencil whether one is uncovered or covered, whereas movement inwards or outwards on uncovering (latency) shows lack of balance.

There is one group of cases with defective vision which is worthy of special mention. Let me take a typical instance.

Pilot W: His right vision was  $\frac{6}{10}$  and his left vision was  $\frac{6}{12}$ . With + 0.75 diopter spherical lens and - 4 cylinder with the axis at  $175^\circ$  the vision of the right eye became  $\frac{6}{10}$ , while with - 0.75 diopter spherical lens and - 3 cylinder with the axis at  $45^\circ$  the vision of the left eye became  $\frac{6}{10}$ .

There are many with a similar condition. Yet they flew successfully right through the war. There is no defect in muscle balance and they are often unaware of any defect in visual acuity because they are practically emmetropic in one meridian. By screwing up the eyes and thus pin pointing the pupils in good day light, they can read  $\frac{6}{6}$ , because they eliminate their astigmatism in this way. This particular officer had never worn glasses.

The case quoted is an extreme one, but only shows how big a defect may exist and yet not interfere with flying efficiency.

The only difficulty he complained of was in making landings at night. He made them and did so successfully, but found them more difficult than did other pilots, the dilated pupils causing him to be more astigmatic.

In this connexion one may mention night blindness. By using the Birsch Hirschfeld photometer made by Zeiss we have not so far detected nyctalopia in a pilot.

Another special difficulty in arriving at a decision to pass or fail was in a man with an amblyopic eye. He was a pilot who had flown successfully during the war and applied for a commercial licence in 1922. The vision of his right eye was perception light with a normal field. Examination of the eye revealed no defect to account for the poor visual acuity. The left eye was in every respect a normal eye with a normal vision,  $\frac{6}{5}$ . Ocular movements were normal in all directions. He was regarded in flying circles as one of the soundest pilots in the Australian Flying Corps and was eventually passed on the advice of the examiners in London. He was instructed to use the amblyopic eye. He did so by covering the other one at odd times and the visual acuity has improved to  $\frac{6}{36}$ .

The interesting thing about him is that although his visual acuity in one eye is poor, he seems to have binocular vision for large moving objects, owing to the good field vision of the amblyopic eye.

#### Cardio-Vascular Lesions.

It may be worth while for a moment to consider the question of cardio-vascular disability.

Most cases are easy of decision. For example, a man of forty who applied for a licence, was found to have a mitral regurgitation, a hypertrophied heart, a systolic blood pressure of 195 millimetres of mercury and a diastolic pressure of 140. He was rejected. To him flying was everything. He flew without a licence and was killed, possibly by a pure accident, but it was obviously unwise for him to fly.

It is, however, the borderline conditions which are difficult, such as a man with a raised blood pressure and no other abnormality to be found, the blood pressure often varying from time to time. It would seem that only repeated examination and continued observation will enable us to come to a decision.

It must be remembered that in civil life, to reject a man is sometimes to rob him of his livelihood and the applicant for licence is entitled to every consideration. It was found in the early days of flying that many men passed by the doctor were not successful in flying. The mental aptitude, so difficult to estimate, was lacking. Various devices for taking reaction times have been used in endeavour to pick out the right man and the wrong man.

The French relied on the simple reaction times for visual, tactile and auditory stimuli obtained by the d'Arsonval chronometer.

It was found that rapid reaction times, particularly when maintained over a series of experiments, were a valuable index of the right type. Numerous more complicated mechanisms have been devised, that of Reid seeming to give the best results.

He has devised a dummy cockpit of an aeroplane, in which the time occupied in carrying out certain movements of the stick and rudder bar is recorded on a revolving drum. The movements are delicate, the right hand and both feet being used simultaneously, as in the actual control of an aeroplane in flight. Considerable concentration is needed to perform the tests quickly and accurately and fatigue is easily perceptible. It will be readily understood that the times recorded over a series of experiments will be very valuable in picking out the best man. It is also found that a pilot by practice with the instrument can improve his flying ability.

Reid's instrument is costly; its price is £826 5s. One has been installed this year at Point Cook and is already proving its value. Should the aero clubs so desire, arrangements could be made for the testing of any prospective pupil at Point Cook, but any aero club putting through a large number of pupils should seriously consider installing an aptitude apparatus which would be a great help to both medical officers and instructors.

Possibly no other avocation makes greater demands upon the physical and mental condition of the subject than aviation and the highest medical standard of efficiency is required of the aviator during his flying career. A man who is first class life assurance risk, will not necessarily pass the medical examination for flying nor will the master mariner who passes the ophthalmologist, necessarily survive the eye examination prescribed for aviation.

Again, experience has shown that many men who who never could pass the tests prescribed, have flown with every degree of confidence and success. An able brain can overcome physical defects.

Thorough examination by a physician, a specialist in ophthalmology and a specialist in otology and careful assessment by a board of medical men conversant with flying conditions and the international medical requirements for air navigation are the basis upon which pilots should be selected. This is my considered opinion after eight years' experience both as examiner and as assessor.

With the development of further safety devices in flying the time will come when such high standards of physical fitness will not be necessary for civil flying, but that time is not yet.

On the other hand, as greater and greater speeds are attained in flight, service pilots will need to be indeed almost supermen to withstand the strain.

My thanks are due to the pilots of the Royal Australian Air Force and of commercial aviation in Australia for the interest they have taken in their examinations and the help they have given the examiners. I would also like to take the opportunity of thanking Flying Officer J. Swift, of the Royal Australian Air Force, for his help in the gathering of the material for this paper, also the medical examiners in all States and the medical officers at Point Cook and Laverton on whose work I have freely drawn. The paper will, I hope, be of service



ILLUSTRATIONS TO THE ARTICLE BY DR. W. W. INGRAM AND DR. P. E. W. SMITH.



FIGURE I.



FIGURE II.



FIGURE III.

ILLUSTRATIONS TO THE ARTICLE BY DR. W. W. INGRAM AND DR. P. E. W. SMITH.

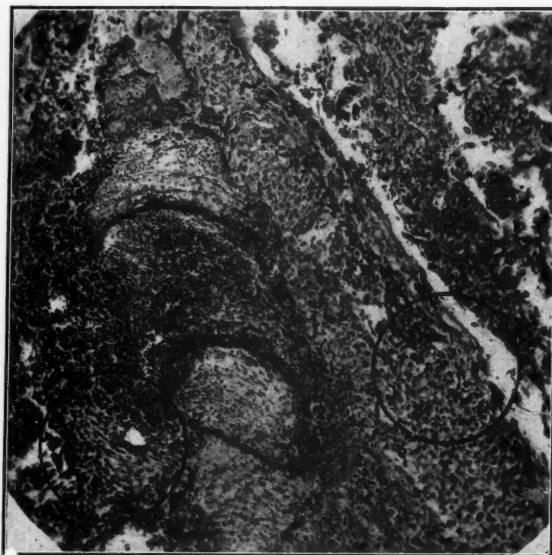


FIGURE IV.

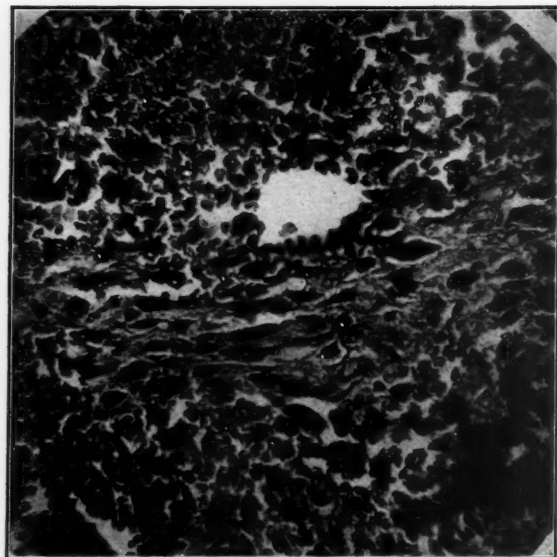


FIGURE V.

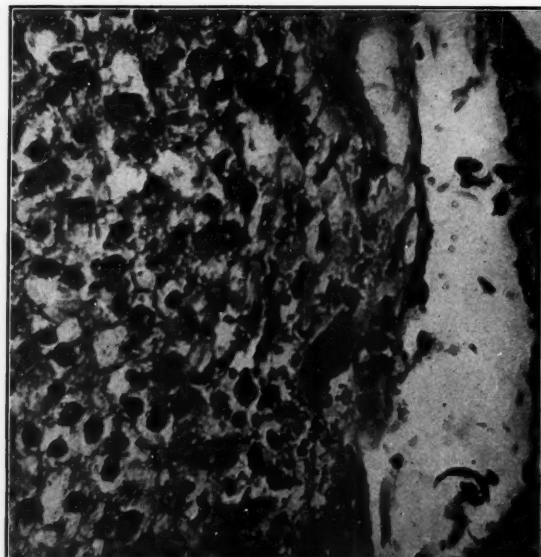


FIGURE VI.

to the medical profession and a guide to the selection of suitable candidates for civil and service flying training.

# LABORATORY METHODS OF INTEREST TO THE GENERAL PRACTITIONER.<sup>1</sup>

By R. G. WILLIAMS, M.B.,

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Western Australia.

In the course of the paper which I have the honour to read tonight, it is my intention to discuss first the duties of a pathologist at a mental hospital, then to describe as much of the work done in the laboratory as is likely to be of general interest. The tests to come under consideration include the indican test, renal efficiency tests, liver tolerance tests, endocrine and vegetative nervous system tests, together with the results of routine Wassermann tests. Finally, some mention will be made of interesting points in the malarial treatment of general paralysis of the insane.

In some ways a pathologist at a mental hospital is in a more favoured position than any other medical practitioner. General practice involves an immense amount of hard work, what might be called automatic work, work which allows little time for reflection or experimentation. Hurried perusal of the journals is about the limit of a general practitioner's reading and the cares of his practice leave him little time to study the apparently abstract problems of medicine. Consultants in their various branches are fully engaged in their curative duties. The general pathologist also spends the bulk of his time in carrying out routine tests. He has little time for tests of doubtful value and still less time for attempting to evolve new tests.

The pathologist at a mental hospital, on the other hand, has a smaller amount of routine work. He has a large number of patients under his continuous observation. He can observe them in health, in sickness and after death, using whatever methods of examination he thinks fit. In this way he can keep in close bedside touch with the actual patient (a privilege usually denied the general pathologist or bacteriologist) and at the same time he can carry out laboratory tests of varying complexity. The research worker, pure and simple, is liable to become abstract and to lose the clinical aspect in his work and his results, though extremely valuable, have often no clinical bearing.

A pathologist at a mental hospital should devote some considerable time to the evolution and perfection of clinical tests which are likely to be of value to medical practitioners in general and to those engaged in treating the mentally disordered in particular.

## Urine Tests.

In this laboratory considerable time has been devoted to the test for indican in the urine. It has been claimed on the one hand that the indican test is a test for liver function and on the other that it is a test for alimentary toxæmia. The indican reaction is also said to be obtainable in many persons with mental disorder. One was led to attempt to verify these findings and then to link up one of the two former interpretations of the test with the later observation.

The indican test is carried out as follows. To five cubic centimetres of urine five cubic centimetres of Obermeyer's reagent are added. After five minutes three cubic centimetres of chloroform are poured gently into the tube. When indican is present a deep blue colour develops in the chloroform layer. The following are the results obtained.

The test was carried out with 504 samples of urine. A reaction was obtained in twenty-seven. Indican was rarely demonstrated in the urine of patients newly admitted to hospital. It was occasionally found in the urine of patients who were seriously ill, suffering from pneumonia, typhoid fever and other diseases.

A reaction was obtained fairly consistently in the urine of a normal control, a healthy, active, athletic young man (the laboratory assistant).

The urine of most of the patients exhibiting a reaction was subjected to other liver tests, the lævulose tolerance curve, the Van den Bergh test and urinary urobilin and urobilinogen tests.

No reaction was obtained either to the lævulose tolerance test or to the Van den Bergh test. In a few instances urobilin was present in excess in the urine, but the urine became normal when the test was repeated a day or so later. No significance could be attached to its presence.

In the case of the healthy control there was no reaction to the lævulose and the liver tests, even on a day when his indican reaction was strongly developed.

As a result of these findings, the indican test can scarcely be regarded as a liver function test.

The control admitted a tendency to constipation. The following investigation was then carried out with his cooperation. The indican content of morning and evening specimens of urine were correlated with the action of the bowels and with the taking of aperients. He was also given an alleged intestinal antiseptic, "Dimol," by mouth over the whole period of three weeks. The conclusions were that when the bowels were free, no reaction was obtained, but a day of constipation caused a reaction to appear on the following day and to last for one or two subsequent days. Now, months later, while his bowels are well regulated ("Petrolagar" being used as an aperient), no indican reaction is obtained. It is a pity that these tests were not correlated with an examination of the intestinal flora.

These results are in keeping with results obtained with the urine of patients and the conclusion drawn

<sup>1</sup> Read at a meeting of the Western Australian Branch of the British Medical Association on March 24, 1929.



is that while the indican test is of no value as a liver function test, it may possibly be of service as a contributory test in ascertaining whether or not a condition of intestinal stasis exists in a patient.

During the course of these investigations new patients were examined according to the following plan.

SYSTEM FOR LABORATORY INVESTIGATIONS WITH A VIEW TO DETECTING LIVER, KIDNEY AND ALIMENTARY DERANGEMENTS.

Examination of urine	presence of pus and organism, indicative of local infection	
	presence of albumin or casts to be followed by tests for kidney function	{ blood urea estimation urea tolerance curve
	Indican reaction to be followed by	{ (I) tests for liver function (see below). (II) tests for alimentary disorder { growth of organisms effect of intestinal antiseptics
	presence of { urobilin or urobilinogen }	to be followed by tests for liver function { Van den Bergh test Inulose tolerance curve
	presence of acetone, indicative of	{ (I) starvation (II) metabolic upset, to be followed by liver function and other tests
	presence of sugar to be followed by usual investigation of glycosuria	
	presence of bile to be followed by Van den Bergh and other appropriate tests	

No striking conclusions were arrived at except that the urine of 20% of the male patients harboured some pus cells.

Blood Urea Estimation.

Renal function tests are of importance to medical practitioners. When faced with a possible case of uræmia, the physician feels the need of a definite test. The presence or absence of albumin in the urine (if urine is obtainable) is not entirely satisfactory. A blood urea estimation can be done very simply in the following manner, with the use of the Ryffel-Ambard apparatus.

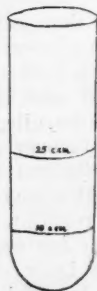


FIGURE I.



FIGURE II.

Take a wide glass test tube, graduated at ten and at twenty-five cubic centimetres. Pour in ten cubic centimetres of 20% trichloroacetic acid. The tube can then be carried to the patient. Withdraw from

the patient's arm approximately ten cubic centimetres of blood (judged roughly by eye) allowing the blood to flow into the graduated tube. With a little practice a syringe is found to be unnecessary. When deproteinization is complete, a chocolate mass resulting, add water from a burette until the twenty-five cubic centimetre graduated mark is reached.

By subtracting the volume of water required to bring the contents up to twenty-five cubic centimetres from fifteen (25 - 10 cubic centimetres of trichloroacetic acid) the volume of blood taken is obtained. This method is at least as accurate as that of measuring the blood from a syringe.

Now shake and filter. Measure the volume of the filtrate and to the clear filtrate add one or two drops of a phenolphthalein solution and then 20% caustic soda until the solution turns a definite pink colour. Now carefully pour the solution into the apparatus. Press the rubber bulb until the level is just higher than the tap and then close the tap. Fill the upper part of the tube with fresh sodium hypobromite solution and by turning the tap slowly allow the hypobromite to run into the tube below the tap. Close the tap firmly and shake. After shaking for a while allow to stand and then, when no more gas is evolved, read off the volume of nitrogen in the tube. The percentage of urea in the blood can be obtained by using the simple formula:

$$\frac{N \times 25 \times 100}{B \times F \times 0.37}$$

where N equals the volume of nitrogen, B the volume of blood and F the volume of filtrate.

The result obtained by this method is not very accurate, but any reading of more than forty milligrammes per hundred cubic centimetres is indicative of kidney defect. In uræmia the result may be 180 milligrammes or higher.

A blood urea estimation such as the above is a rough, almost a bedside test. Still, in this hospital, among thirty-nine patients selected at random (not bedridden or ill) the urea content of the blood was below thirty-five milligrammes per hundred cubic centimetres and in only twelve was it above forty milligrammes. In these patients there were other clinical and urinary signs of kidney defect.

If the practitioner is faced with the problem of an apparently healthy man who has a trace of albumin together with some casts frequently present in the urine, more elaborate tests are necessary. I favour in such cases not a urea concentration test, but a blood urea curve carried out in the following manner.

Specimens of blood (0.2 cubic centimetre) are collected by capillary puncture from the patient before and at half-hourly intervals for two and a half hours after the ingestion by the patient of fifteen grammes of urea in a quarter of a litre of water. These specimens are then examined according to the technique of Twort, modified for the colorimeter by H. L. Shipp and myself.

The blood urea curves obtained by this method are interesting.

Figure III is a control curve. It shows the blood urea fasting level was ten milligrammes per hundred cubic centimetres. Half an hour after fifteen grammes of urea the level reached 24.5 milligrammes. Two hours after the meal reading was 23.5 milligrammes; five hours after, the fast being continued, 19.5 milligrammes.

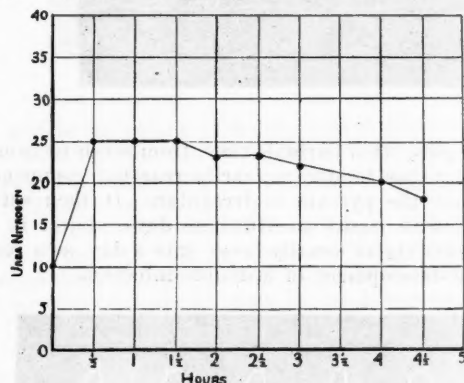


FIGURE III.

Figure IV is a rather valuable control for the method. It was one of three curves taken on one day. It was only after the readings had been plotted that I ascertained on inquiry that the nurse had neglected to give the patient his urea meal. A few days later a curve which was within normal limits, was obtained from the patient.

Figure V was obtained from a patient who had a trace of albumin and some casts in the urine. It appears to indicate that the kidney was unable to deal with the meal of fifteen grammes of urea.

Although the test cannot be said to be fully tried, it is in my opinion likely to be a valuable aid to the consulting physician. It may even be of use in deciding as to the fitness of doubtful candidates for life assurance.

No attempt will be made to describe liver function tests. I have already dealt with one aspect.<sup>(1)</sup> It may, however, be as well to remark that the l  vulose tolerance curve, the urinary urobilin and urobilinogen tests and the Van den Bergh test form a satisfactory triad.

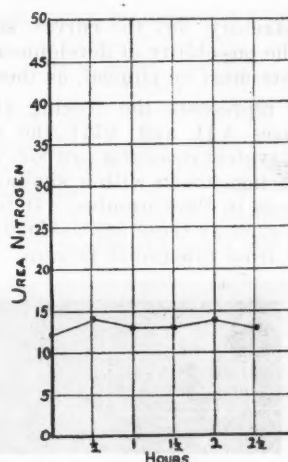


FIGURE IV.

#### The Nervous System.

In regard to tests specially applicable to the mentally disordered, those associated with the endocrine glands and with the vegetative nervous system require most attention.

Blood sugar curves are valuable in demonstrating some kind of endocrine disturbance; this is especially so when the curves are complicated by the injection of pilocarpine, atropine or adrenalin, but they are not sufficiently precise to locate the gland or group of glands at fault.

The technique used is that of Folin and Wu. The method which is far simpler and probably more accurate than that of Maclean, will be demonstrated in the laboratory. The Klett bio-colorimeter is used for the estimation.

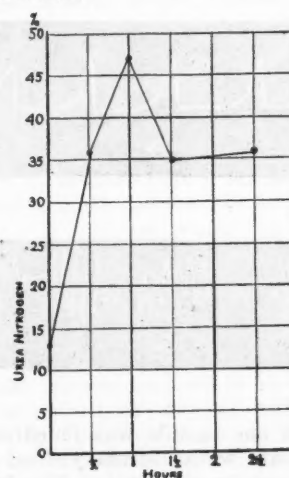


FIGURE V.

With the object of demonstrating an increase of plastic tone in the voluntary muscles, indicating possibly an overaction of some fibres of the sympathetic system, I obtained some rough myograph tracings of muscle volume response to single faradic shocks. The apparatus used, an old sphygmograph,

was not satisfactory, but the curves, such as they are, suggest the possibility of developments on these lines. The tests must be clinical, as these were.

Figure VI represents the tracing of a typical control, Figures VII and VIII the tracings of patients with typical *dementia præcox*, Figures IX, X and XI tracings taken with a similar apparatus showing tremors in Parkinsonism. It is considered that tracings such as these are useful in differentiating organic from functional tremors.

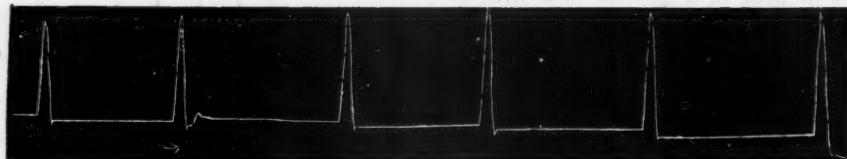


FIGURE VI.

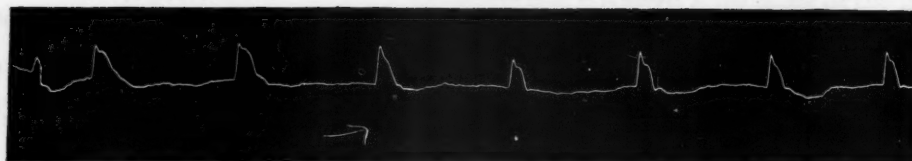


FIGURE VII.

#### The Wassermann Test.

Since last March one hundred and thirty-five Wassermann tests with blood serum have been done for us by the Public Health Department. For this we are much indebted to Dr. McGillivray. A strong reaction was obtained with only thirteen, while the

satisfactory results with the technique. On some days the estimations seemed easy, at other times counting the crystals seemed almost impossible. However, in three patients an increase in the blood calcium index was determined as a result of oral calcium therapy.

#### Malarial Therapy in General Paralysis of the Insane.

In the malarial treatment of general paralysis of the insane, blood of patients infected with benign tertian malaria is injected intramuscularly in suit-

able cases. In a variable time, from seven to twenty-one days or longer, a febrile reaction commences. At first the pyrexia is irregular. It then settles down, with rigors on alternate days. Later in the infection rigors usually occur once a day, as a result of the development of a double infection.

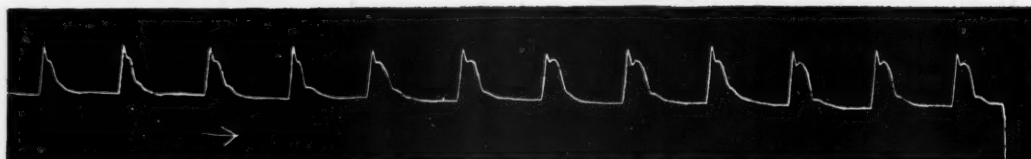


FIGURE VIII.



FIGURE IX.

response with one sample was indefinite. Of the thirteen patients whose serum yielded a reaction, eight were recently admitted. The frequency of reactions to the Wassermann test among newly admitted patients was only 6.6%. This appears to be an unusually low figure. No tests with cerebrospinal fluid have been included in the series.

Fifty-five estimations of the calcium content of the blood were carried out by Blair Bell's crystal counting method. I was unable to obtain really

Parasites are not usually seen in the blood until after the third rigor. The infection is easily stopped by the administration of quinine. The indications for stopping the malaria are jaundice, considerable increase of urobilin and urobilinogen in the urine and a defective lævulose tolerance curve, together with any material change for the worse in the patient's general condition.

So far in this hospital a sufficient number of patients has not been treated to enable me to



analyse the results. It is possible, however, to say that in every patient treated some improvement has been noticed. In three the improvement is striking. The malaria in these patients has been followed up by arsenical treatment.

In view of the improvement brought about in certain patients suffering from melancholia and from *dementia præcox* by acute fevers, an effort will be made to try malarial treatment in suitable forms of these conditions. Before this can be undertaken,

#### THE IDEAL WASSERMANN TEST.

By A. E. FINCKH, M.B.,  
Sydney.

A LABORATORY test for the diagnosis of syphilis in order to be regarded as ideal must satisfy the following demands:

(i) Its efficacy must have been proven by its use extended over a number of years and on thousands

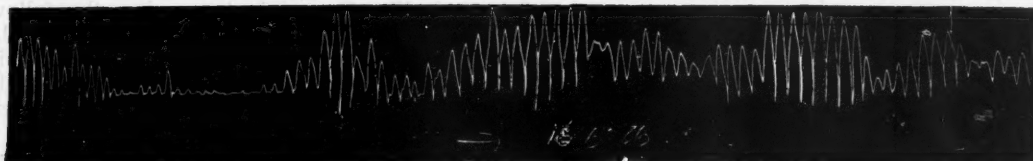


FIGURE X.

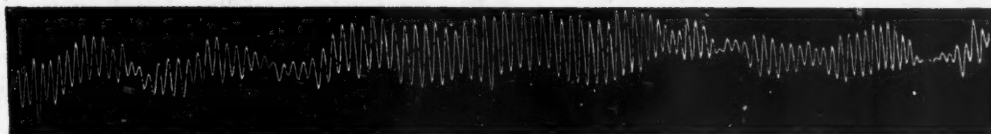


FIGURE XI.

it will be necessary to secure a syphilis-free strain of infected blood. One could scarcely inject syphilitic blood from a general paralytic into a syphilis-free patient.

At present we are attempting to obtain this strain through the medium of mosquitoes (the *Anopheles annulipes*). Mosquitoes in various stages of development are on view in the laboratory.

In the neighbourhood of the hospital the anopheles is by no means common and even when numbers of larvæ, pupæ and fully grown mosquitoes have been collected, we find great difficulty in keeping them alive under laboratory conditions. Few of the mosquitoes can be tempted to feed through gauze. The anopheles, of course, is not a proved vector. It is, however, a strong suspect. With perseverance we may succeed in infecting several of the mosquitoes with the benign tertian parasite.

There are three reasons which make it better for the purpose of treatment to infect the patient by blood injection rather than by mosquito bite. They are: (i) Blood injection is the more certain method of infecting the patient, (ii) it is easier to stop an infection transmitted by blood injection than one transmitted by mosquito, (iii) mosquito transmitted infection gives greater liability to relapse of the malarial infection.

Temperature charts of patients undergoing malarial treatment are on view in the laboratory.

I am indebted to Mr. E. T. Cosson, my assistant, for his active help and to Dr. J. Bentley and Dr. E. J. T. Thompson and Dr. G. Bury for their assistance and advice.

#### Reference.

(1) *The Lancet*, November 19, 1927, page 1071.

of patients and by its comparison with other well known methods.

(ii) The reagents used must be of such a nature that their reliability is unquestionable. Their preparation must not involve anything which is not easily controlled and checked.

(iii) The test must include, as is the case in the original test, a series of preliminary tests by means of which the reagents can be tested before any time and labour are expended on the main test.

(iv) The reading off of the results of the preliminary tests, as well as of the main tests, must not require any special training nor involve that personal equation which in some methods is said to make it imperative that it should be left to the person who actually performed the test.

The check on the method must lie in the ease and precision with which any responsible person can arrive at a diagnosis from the readings of the results. Any method which involves more than one antigen, demands what has been called "experienced juggling with the results."

When the various methods in use at the present day are examined, it may be said that the one elaborated by Professor Boas, of the State Serum Institute at Copenhagen, is the nearest approach to the ideal. If the above demands be taken *seriatim*, it may be stated that Professor Boas, at the Danish State Laboratory, has been in charge of this sero-diagnostic work ever since the Wassermann test has become established. The first book published on the technique of the test was by Boas; it appeared in 1910. Since then Professor Boas has followed closely all the modifications of the original

method, as is shown in the third edition of his book. In a letter to the author of this article a few months ago he expressed his implicit faith in his own technique.

The summary published by him a few years ago, reveals that his method gives results which are second to none. In congenital syphilis the response is always a reaction. In general paralysis of the insane the test carried out with serum constantly yields a reaction; a reaction is obtained in about 94% when the cerebro-spinal fluid is used. The serum of untreated patients suffering from *tuberculosis dorsalis* invariably yields a reaction; when the cerebro-spinal fluid of these patients is employed, the percentage of reactions is slightly lower. A reaction is obtained with the serum of about 50% of patients with latent syphilis; only occasionally is a reaction obtained when the cerebro-spinal fluid of these patients is employed. The test applied to the serum of patients with tertiary syphilis yields a reaction in 97%, whereas a reaction is rarely encountered when the cerebro-spinal fluid is used. The serum of persons suffering from secondary syphilis constantly yields a reaction. If the cerebral system is not involved, the cerebro-spinal fluid does not usually yield a reaction. Failure to react with the serum of patients with primary syphilis has no diagnostic meaning.

The reagents used are similar to those recommended by Professor Wassermann as early as in 1910. The antigen is the easily prepared alcoholic heart extract. The dangerous necessity for the addition of cholesterin is obviated by the reduced dose of complement, as determined in one of the preliminary tests. The complement of any normal guinea-pig can be employed in the test. Any difference that may exist in the complement of not carefully selected animals, is counterbalanced by the double titration in the preliminary tests. The haemolytic system is the usual rabbit-sheep's blood combination.

In the Boas method the preliminary tests are of primary importance, as was the case in the original Wassermann method. He employs three preliminary tests as compared with one in the original method. By means of these tests the doses of the complement and of the amboceptor are determined. Unless the preliminary tests give precise readings, the main test is not proceeded with.

In the reading off of the results the Boas method leaves no room for indecision. The preliminary tests leave no doubt in regard to the dose of complement and amboceptor to be used, whereas the fact that only one antigen is employed, avoids all complicating differences.

#### Summary.

The Boas method depends on a carefully worked out method of titration of amboceptor, complement and antigen, in order to avoid the addition of cholesterin to the antigen. A single antigen is employed, easy of preparation; it is used in a constant dose. The double titration of the complement

obviates the necessity of carefully selecting the guinea-pigs used. The preliminary tests are performed independently of the main test. The main test is not begun before the reagents have been proved suitable in the preliminary tests. The ice-box is not used; the binding of the complement is insured by allowing the tubes to stand for three-quarters of an hour at room temperature, followed by three-quarters of an hour at 37° C. in the incubator.

In addition to the above facilities, the Boas method, like the original one, has the following advantage in regard to institutions where large numbers of specimens of serum have to be examined. All the preliminary tests can be performed regularly at a certain time of the day, early in the morning or late in the afternoon. The main test can then follow quite independently, either in the afternoon or early on the following morning respectively.

Inversely, it may be stated that the Boas method does not require specially selected guinea-pigs for the complement; that the antigen is not of a complicated nature; that the antigen does not require titration, being used in a constant dose; that cholesterin is not employed; that the test is not complicated by the use of more than one antigen for each test; that the ice-box is not employed; that the danger and annoyance of possibly completing a two days' test before the unsuitability of one or other of the reagents is made evident, is avoided; that the personal equation is not a factor in the reading off of the results; that the percentages of reactions for all stages of the disease are not less than those of any other method.

#### PERSISTENT NASAL DISCHARGE AND CHEST COMPLICATIONS IN CHILDREN DUE TO INFECTION OF THE MAXILLARY SINUSES:

##### A PRELIMINARY REPORT.

By J. PARKES FINDLAY, M.B., Ch.M. (Sydney),  
Sydney.

A PERSISTENT nasal discharge in children seems to be disregarded by parents as it has not been realized that complications can arise from this, such as (i) chronic bronchitis, (ii) asthma, (iii) bronchiectasis.

I am treating specifically with that nasal discharge resulting from infection and suppuration of the maxillary sinuses. It is the infection of the maxillary sinuses which is the most important fact to be recognized, as this infection of the antra is the ætiological factor of the chest complications.

This opinion is based upon the results obtained on children suffering from maxillary sinus infection at the Royal Alexandra Hospital for Children.

Children who are suffering from this persistent nasal discharge with or without a cough, should have the cause of the nasal discharge diagnosed early and treated before the infection involves the

lungs with the resulting chronic bronchitic and bronchiectatic changes.

Children with persistent nasal discharge with and without a cough, can be classified into two groups clinically: (i) those who have not had their tonsils and adenoids removed, (ii) those who have had their tonsils and adenoids removed.

In group (i) the essential treatment is to have the tonsils and adenoids removed at once and if any nasal discharge persists after operation, then the sinuses should be investigated.

In the investigation for sinus infection, transillumination and X ray findings are generally relied upon. In my opinion X ray examination in children is especially doubtful for sinus work and I do not depend on the radiographic picture or transillumination.

For positive diagnosis of maxillary sinus infection in children lavage of the sinuses is surest and this is performed under local anaesthesia on suitable children. I use  $\beta$  eucaine, 5% to 10%, with a few drops of one in a thousand adrenalin solution. If the child is too nervous or young, ethyl chloride is very satisfactory for puncture of the antro-nasal wall. In young children it is dangerous to puncture under the inferior turbinate as the floor of the sinus is sometimes higher than the floor of the nose, although this varies. Mr. Dan Mackenzie mentions this in his article on persistent nasal discharge, read at the last annual meeting of the British Medical Association. I have noticed this repeatedly when performing the intranasal antrostomy on young children in whom it is safer to puncture the antro-nasal wall in the middle meatus just above the attachment of the inferior turbinate.

The nasal cavities should be gently syringed out just before the sinuses are punctured or thoroughly cleansed by the child blowing its nose.

If the lavage of the antra yield material containing pus, muco-pus or thick threads, it is advisable to open and drain the sinuses into the nose by performing an intra-nasal antrostomy.

A Caldwell-Luc operation should not be performed on children under twelve as it will probably interfere with the child's second dentition. Following the operation by an intra-nasal method irrigation of the sinuses should be carried out with normal sterile saline solution until the infection of the sinus clears.

It is pleasing to notice that up to the present the results of the intranasal operation are very gratifying. The ventilation and drainage of the sinuses seem to have a remarkable effect on the mucous membrane of the bronchi and bronchioles, the cough in many instances clearing rapidly, the chest signs on physical examination diminishing very quickly, sometimes disappearing altogether, especially in chronic bronchitis and asthma. With regard to bronchiectasis the period of time has not been of sufficient duration to pass an opinion; the child must be operated upon before cavitation becomes too extensive, although this is no contraindication

against an operation as the primary source of infection must be cleared up.

Later this year I propose to publish more fully the method of operation with results and statistics obtained over a period of twelve months.

## • Reports of Cases.

### CASE OF MULTIPLE NEW GROWTH OF THE LUNG AND MEDIASTINUM OF OBSCURE NATURE.<sup>1</sup>

By W. WILSON INGRAM, M.C., M.D. (Aberdeen),

AND

P. E. WALTON SMITH, M.B. (Sydney), M.R.C.P. (London),  
From the Royal North Shore Hospital of Sydney.

#### Clinical History.

E.G., AGED nineteen years, was admitted to hospital on April 17, 1929, with a history of having been ill for fourteen days. The recommending doctor stated that the illness had commenced as an ordinary acute pleurisy on the right side, with pain aggravated by breathing, pyrexia, some dyspnoea and slight cough. In the course of the fortnight the patient became worse. The cough increased in frequency and violence and an increasing amount of blood stained sputum was voided. The dyspnoea became worse and he had had night sweats.

There had been no similar previous attacks, the only previous illness being whooping cough four years earlier. The family history was not suggestive. The patient had lived all his life in Western Australia. His occupation at the time of the onset of this illness was that of cleaner in a tramway shed.

On admission he was seen to be a very ill lad. Deep breathing caused him obvious distress. A moderate degree of cyanosis was present. The temperature was 38.3° C. (101° F.), the pulse rate 96 and the respiratory rate 28 per minute. Examination of the respiratory system showed that expansion of the chest was limited but equal on both sides. The superficial veins were not engorged and there was no apparent oedema. There was impairment of the vocal fremitus in the left axilla, while the percussion note was impaired in the right apical region. The breath sounds were weak in quality, being most faint in both axillary and the right apical regions. A friction rub was heard in the right axillary region. The cardio-vascular system was found to be normal, no cardiac displacement was detected. No abnormality was detected in any other system.

During the twenty-two days which elapsed between the admission of the patient and his death, there was a steady decline in his condition. Copious amounts of blood stained sputum were voided and there was constant pleuritic pain in the right axilla. Dyspnoea steadily increased, as did the severity and frequency of the cough, causing the patient much distress. Two weeks after admission, dullness developed over the base of the left lung, while a friction rub and breath sounds of a tubular quality were heard in the same area. A week later there were discrete patches of dullness and tubular breathing in both sides of the chest. In the next three days dyspnoea and cyanosis became very distressing while there was a good deal of vomiting. He gradually became exhausted, sank into a stuporous condition and died on the evening of May 11, 1929.

The following special investigations were carried out:

Sputum was examined. Neither tubercle bacilli nor hydatid elements were found. The predominant organism in the sputum was a hæmolytic streptococcus.

The Casoni skin test yielded no reaction.

<sup>1</sup> The specimens described herein were shown at a meeting of the New South Wales Branch of the British Medical Association on June 13, 1929.



A full blood count revealed a moderate grade of secondary anæmia with a neutrophile leucocytosis. The total leucocyte count was 27,000 per cubic millimetre, 95% of these being polymorphonuclear leucocytes. There was no eosinophilia.

An X ray examination on April 23, 1929, revealed multiple circular areas of dullness throughout both lungs, with some irregular patches in both perihilar regions, suggestive of a tuberculous lesion. The possibility of the presence of hydatid disease was suggested. A copy of this skiagram is reproduced (Figure I).

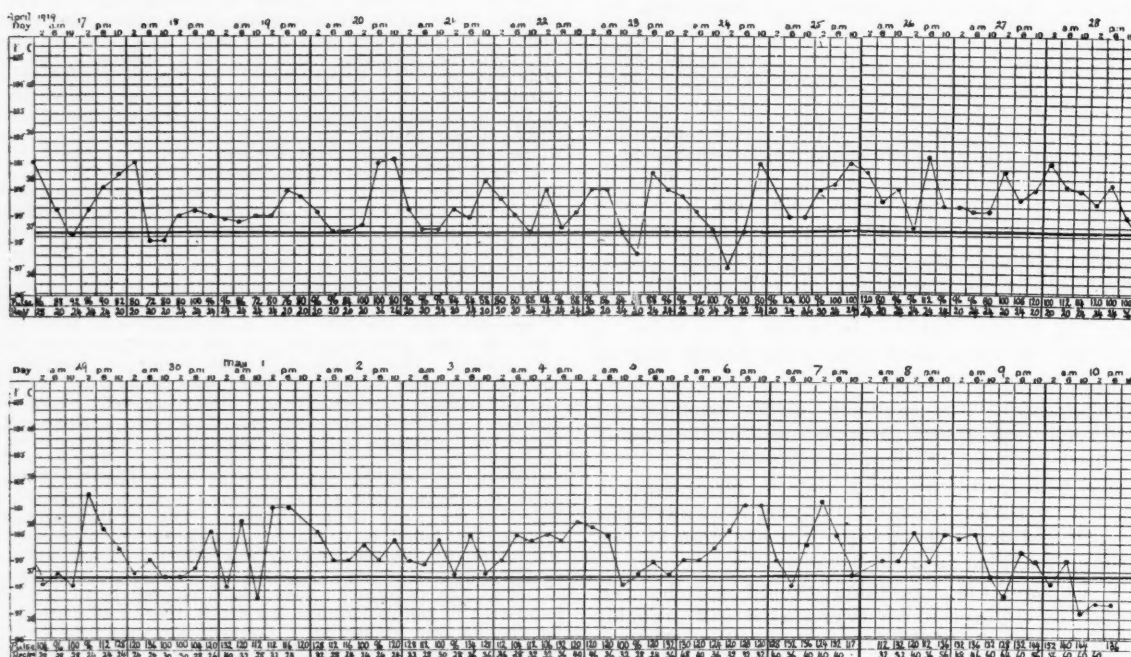
A second skiagram taken on May 10, 1929, seventeen days after the first, showed that there had been considerable progress, the appearance suggesting definitely malignant metastases, probably sarcomata or hypernephromata.

Throughout his stay in hospital the patient's temperature ranged between 37.2° and 38.9° C. (99° and 102° F.), with occasional matutinal remissions to 36.1° or 36.7° C. (97° or 98° F.). After the first week there was a gradual increase in the pulse rate from an average of 95 per minute to 120 per minute, while during his last few days it kept in the region of 140 per minute. The clinical charts are published herewith.

definitely nodular appearance due to numbers of blood stained masses which varied in size from that of a marble to that of a small orange. These were scattered throughout the substance of the lung and so numerous were they that very little normal lung tissue remained; the condition was more pronounced in the right than in the left lung (see Figures II and III).

There was no fluid in the abdomen, the liver was fatty and on section numerous growths were found. The kidneys appeared to be normal, the left suprarenal was also normal, but the right was definitely enlarged. The spleen was small and showed the presence of areas resembling infarcts (unfortunately sections of the spleen were not taken). The other organs manifested no abnormality and no growths were found in any of the bones.

From the naked eye examination of the distribution of the growths in the lung it seemed conclusive that the condition was not one of primary new growth in that organ, but that the numerous nodules were metastatic deposits conveyed from the mediastinal mass which was itself the primary, the other possibility being that the tumour in the mediastinum was secondary to a new growth in the adrenal.



The respiratory rate was fairly consistently in the region of 24 per minute during the first two weeks, except during paroxysms of dyspnoea, when it reached 36 to 40 per minute. As time went on these dyspnoic paroxysms became more and more frequent; the rate in the intermissions steadily rose until an average of 40 per minute was maintained. During the last day the rate was 60 per minute.

#### Pathological Findings.

Post mortem examination revealed the presence of a large mass in the anterior mediastinum having the following dimensions: 12.0 centimetres long, 7.5 centimetres wide and 7.0 centimetres in thickness. This mass was somewhat nodular, was firm to the touch, manifested a honeycomb appearance on section and contained a small cyst filled with blood at its base.

There was free blood stained fluid in the thoracic cavity; the lungs were large and firmly adherent to the diaphragm, partly adherent to the parietal pleura. They presented a

On examination of microscopical sections of the growths it was evident that they had originated from some type of epithelial, or possibly endothelial cell. The distribution of the cells was most irregular. There was no alveolar formation, the cells being found as irregular columns or in small or large masses, the individual cells of which varied greatly in size and shape; giant cells were present. In some masses the cells were rather large, loosely arranged and vacuolated, the nuclei in some were hyperchromatic, in others pale; in other clumps the cells were more compactly arranged, small and granular.

There were many thin walled blood channels and in places there appeared to be an attempt at a perivascular arrangement of the cells. Collections of leucocytes were noted and areas of fibrosis, the latter being more noticeable in the mediastinal growth. The outstanding features were, however, the extensive hæmorrhages and the massive areas of necrosis present. Figure IV is a low power photomicrograph. The higher power photomicrographs of the areas encircled in Figure IV are found in Figures V and VI.

## Comment.

The problem now resolved itself into one of differentiation between the following conditions: Thymic tumour, endothelioma of the mediastinal lymphatic glands, embryoma, adrenal carcinoma.

The commonest tumour of the thymus is a lymphosarcoma; it is evident that the condition under consideration is not an example of this class of growth. A thymic carcinoma is described as arising from the reticulum cells; it usually does not occur until after the age of fifty; it is rather slow growing and less malignant as regards metastatic involvement than other types of carcinoma.

Diffuse endothelioma of the lymphatic glands may give rise to masses of cells resembling those described above. Ewing<sup>(1)</sup> states that embryonal epithelium resembles endothelium. Here again, however, the growth is rather slow and the tendency is to invade other chains of glands, although metastases have been noted in the thyroid and adrenal glands.

That the new growths here described represent some form of embryoma is the opinion of Professor Welsh whose report is given later.

In regard to adrenal carcinoma, on examining the histological characters of the cells found in the tumours of the mediastinum and the lungs (large clear cells and small granular ones) an adrenal origin suggested itself. This seemed to be confirmed by the finding of an abnormal proliferation of the cells in the substance of one adrenal, the other adrenal being quite normal. Cases of diffuse carcinoma of the adrenal are described of intense malignancy and so giving rise to early metastases in the liver, lungs and brain, a feature of the growths being the tendency to hæmorrhage and necrosis. It should be noted here, however, that whereas in the mediastinal, lung and liver nodules hæmorrhage and necrosis are outstanding features, in the adrenal there is no necrosis and only a few small hæmorrhages, so that it is possible that the condition in the adrenal may represent some aberrant type of hyperplasia rather than true neoplasm.

It should also be noted that the secondary disturbances (pigmentation *et cetera*) sometimes but not invariably associated with adrenal growths were absent.

Professor D. A. Welsh has been good enough to examine the naked eye specimens and sections of the growths and has submitted the following report:

I have not been able to give your remarkable and interesting case (of multiple newgrowths in a boy of nineteen years) the attention that it deserves and that I should have liked to give. But I have spent the best part of an hour going over the naked eye and microscopic specimens.

On the whole I think that the essential element in the newgrowth is some form of embryonic and undifferentiated epithelium. I could not identify that epithelium, nor did it appear to have reached such a state of development as to form any diagnostic arrangement of the epithelial cells (which appeared to form irregular and largely continuous cell masses). An interesting possibility is that this embryonic epithelium is consistent with an origin from aberrant trophoblast and that is further consistent with the extreme hæmorrhagic and necrotic tendencies shown by the nodular masses of the growth.

From the specimens submitted I think it is more likely that the primary growth was in the mediastinum, where embryonic types of new growth are known to occur and that all the other growths in the lungs, liver, adrenal are possibly secondary. The other possibility is that the adrenal is the primary site.

My provisional diagnosis would be that the newgrowth is a form of embryoma or blastocytoma, in which undifferentiated and embryonic epithelial cells form the principal neoplastic element and that an origin from embryonic trophoblast (accidentally included in the mediastinum) is a distinct possibility and one that is worthy of further consideration and study.

The clinical diagnosis of sarcoma of the lungs was a good one in all the circumstances.

The presenting symptom in this case was severe pain. The onset was sudden and severe and the total duration of the illness was thirty-six days.

In a review of 139 patients with carcinoma of the lung admitted to the London Hospital between 1907 and 1925 Simpson<sup>(2)</sup> found only one example of carcinomatous embryoma in a lad of eighteen. Four growths only occurred in patients under the age of twenty, eleven patients had a history of six weeks or less and the onset was acute in an unstated number of the cases. Pain was the presenting symptom in 64% of the cases.

## Acknowledgements.

The photographs of the lungs and sections are the work of Dr. E. M. Humphery. We are indebted also to Dr. F. G. Griffiths and Dr. S. V. Marshall.

## References.

- <sup>(1)</sup> James Ewing: "Neoplastic Diseases," 1928, pages 339, 812, 974.
- <sup>(2)</sup> S. L. Simpson: "Primary Carcinoma of the Lung," *The Quarterly Journal of Medicine*, April, 1929.

### CÆSAREAN SECTION UNDER GAS OXYGEN ANÆSTHESIA IN A WOMAN WITH A DECOMPENSATED HEART.<sup>1</sup>

By BRIAN H. SWIFT, M.C., B.A., M.B., B.C. (Camb.),  
F.R.C.S. (Edin.),

Honorary Obstetrician, Queen's Home, Adelaide,

AND

GILBERT BROWN, M.B., B.Ch. (Liverpool),

Honorary Anæsthetist, Adelaide Hospital.

PREGNANCY complicated by heart disease has been the subject of numerous papers and addresses during the last few years. The seriousness of the condition has been stressed and the importance of antenatal supervision and treatment definitely proven. In the current comment of *THE MEDICAL JOURNAL OF AUSTRALIA* of April 7, 1928, heart disease and pregnancy were discussed and the high maternal mortality of pregnancies complicated by mitral stenosis and auricular fibrillation was exemplified.

The following case is of interest for three reasons:

1. The woman did not know she had a bad heart until she was four months pregnant, when her heart broke down.
2. Hospital treatment of the heart lesion until labour commenced did not bring back compensation.
3. The excellent result gained by Cæsarean section under gas oxygen anæsthesia with the regain of health of the mother.

## CLINICAL HISTORY.

(BRIAN H. SWIFT.)

Mrs. S.F., aged forty-one, *primipara*, was first seen at the antenatal department of the Queen's Home on September 20, 1927. Her last period had finished on May 1, 1927, but she was rather vague as to her dates. She had been born in England and had always been fairly well, except for colds and anæmia. She had had enteric fever at seven and scarlet fever at fifteen years of age. She had never had rheumatic fever. She had been married two years and had had one miscarriage in May, 1926, when two months pregnant, which she thought had been brought on by dancing.

The patient had been quite well and had not been short of breath and did not know that anything was wrong until she was three months pregnant when she began to get short of breath. This got worse and she developed a cough. She now complained of being very short of breath and that she was bringing up a lot of sputum when she coughed.

On examination the patient was found sitting up and could not lie down. She was breathing rapidly with attacks of coughing. She was a well built woman with an anxious expression and was very flushed.

<sup>1</sup> Read at a meeting of the South Australian Branch of the British Medical Association on September 26, 1929.

The usual antenatal examination was made. The uterus was enlarged to the size of a five months pregnancy. The foetus was presenting by the vertex and the foetal heart was heard. Nothing abnormal was detected in the pelvis which was of normal dimensions.

The heart was enlarged, the beats were irregular; there was a very accentuated first sound with a loud presystolic murmur over the mitral area. The systolic blood pressure was 120 and the diastolic pressure 80 millimetres of mercury. Numerous fine crepitations were heard over both lungs behind with definite dulness at the left base. The urine was acid and contained no albumin. There was no swelling of the feet.

She was admitted to hospital and then transferred to a medical ward at the Adelaide Hospital where she was under the care of Dr. C. T. C. de Crespigny. She remained in the Adelaide Hospital until January 16, 1928, when she came into labour. She was admitted to the Queen's Home at 7.45 p.m. She had started labour about midday and I saw her at 8 p.m., when she was propped up in bed very breathless and becoming very distressed with each pain. Her condition was very critical.

On examination the uterus was enlarged to the size of a full time pregnancy. The foetus was presenting by the head which was engaged in the left occipito-anterior position. The foetal heart was heard. Her heart was fibrillating and a very definite presystolic murmur was heard over the mitral area. The systolic blood pressure was 125 and the diastolic pressure 70 millimetres of mercury. Numerous adventitious sounds were heard over both lungs behind, but there was no oedema of the feet.

The question arose, what was the best way to deliver the child with the least strain on the mother's heart. She was a *primipara* of forty-one with normal pelvis and the head well engaged. However, she was so distressed with each pain before the second stage of labour with its bearing down pains had started, that I thought it inadvisable to allow normal labour to continue. She would undoubtedly have had a long second stage whilst the soft passages were dilating. In consultation with Dr. E. A. H. Russell I decided that Caesarean section under gas oxygen anaesthesia would be the best means of delivery.

Dr. Gilbert Brown gave gas oxygen anaesthesia with his own apparatus and a classical Caesarean section was done, as time was a main factor. The abdomen was opened at 9.15 p.m. and closed at 9.50. The child, a female, weighed 3.27 kilograms (seven pounds five ounces) and breathed at once.

She stood the operation well and beyond distension of her abdomen with excessive vomiting on the second day her convalescence was uneventful. Her heart gradually improved with the aid of "Nativelle" digitaline granules and on February 22 she was discharged. Her uterus had not involuted very well and she still had an occasional brownish discharge, but otherwise she was very well and could walk about.

On April 17, that is three months after the Caesarean section, she reported at the postnatal department. She was very well and had come up to the home by tram and had carried her baby. She had also been doing her house work. On examination the uterus could still be palpated above the symphysis. Her heart had settled down and was quite regular, but there were well marked presystolic and diastolic murmurs over the mitral area. Her subsequent history was of interest. She was unfortunately not sterilized at the operation and she became pregnant again in September and was sent to the Adelaide Hospital to have her uterus emptied. This was done by Dr. Rupert Magarey under gas oxygen anaesthesia when a large ovarian cyst was found. In May, 1929, the abdomen was opened again by Dr. Magarey and the cyst was removed and the patient sterilized at the same time. There was a small gutter in the anterior wall of the uterus which represented a well healed uterine incision.

#### ANÆSTHETIC REPORT.

(GILBERT BROWN.)

Before operation the patient was lying on the operating table with the head of the table raised and she was propped up by three pillows in order to breathe comfortably.

On examination of the lungs moist sounds were heard at both bases, the respiration rate was 20 per minute. The apex beat of the heart was diffuse in the sixth space, a presystolic thrill, presystolic murmur and definite arrhythmia were present. The pulse rate was 96. The systolic blood pressure was 130 millimetres of mercury and the diastolic pressure 65 millimetres. The pressure ratio was 100% (normal is 40% to 60%). The energy index was 13.7 (normal is 13 to 20).

Chloroform and ether were both clearly contraindicated on account of the condition of the heart and lungs. Spinal anaesthesia might have been used, but the risk is considerable. Nitrous oxide and oxygen cause no respiratory irritation, are not cardiotoxic and support the blood pressure.

Induction was carried out without excitement and required two minutes. The operation lasted forty-five minutes during which time there was no cause for anxiety and consciousness was regained in two minutes after the administration was terminated. The condition then was: Pulse rate 96, respiration rate 30, systolic blood pressure 115 millimetres of mercury and diastolic 70 millimetres. There was no postoperative vomiting. The anaesthetic chart showed that the variation of pulse, respiration and blood pressure were very slight.

#### CONCLUSION.

The treatment of this patient represents the typical modern treatment of a pregnant woman whose heart had broken down during her pregnancy. The antenatal examination and treatment allowed her pregnancy to continue and the Caesarean section relieved the heart of the extra strain of labour. Her heart has completely recovered its compensation and she has become again a useful member of the community. She had been spring cleaning her home on the afternoon of the meeting at which she was demonstrated.

### Reviews.

#### PHYSICS FOR STUDENTS OF PHARMACY.

An ordinary small elementary text book on general physics has, according to the introduction, "been compiled to meet the needs of students of pharmacy. The book is intended to cover the syllabus of the Pharmaceutical Society of Great Britain." It probably has and does, but there does not seem to be anything sufficiently different about it to justify its publication. There are available several elementary text books allegedly satisfactory for medical students in which the subject is treated very similarly; the standard of these books, however, is not high enough for Australian medical students.

The book is rather misleading in parts and some units are wrong, a dangerous practice in a text book. The author states: "Since, however, it is expected that all those to whom the book may appeal will have taken a course of matriculation physics at some period in their career, parts of the book must be regarded as a mere epitome of the subject." This would scarcely apply to Australian students of pharmacy; but if they had done any reading, as suggested, to matriculation standard, this book would be of very little use to them; further, we can imagine their extreme bewilderment when informed (page 79) that the mass of 100 cubic centimetres of "a" gas at 76 centi-

76 x 100

metres and 0° centigrade is

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It is not sufficiently carefully written. Without being pedantic, one can object to such expressions as: "This force is called the osmotic pressure." Statements of an analogous nature, the reading of which is really dangerous for the young student, abound.

\* "The Principles of Physics: A Textbook for Students of Pharmacy," by C. J. Smith, Ph.D., M.Sc., A.R.C.S., D.I.C.; 1929. London: Edward Arnold and Company. Crown 8vo., pp. 295, with illustrations. Price: 9s. net.



## The Medical Journal of Australia

SATURDAY, JANUARY 4, 1930.

### A Retrospect.

THE year 1929 has witnessed no dramatic advance in medical science nor any remarkable victory over disease. It has been a year of steady progress, of strenuous endeavour and of average attainment.

We are apt to look upon great discoveries as indications of progress in science and are often neglectful of the essential accumulation of knowledge that precedes its practical application. The hero worshipper prefers to remember only the name of the individual who makes the final discovery and to mark the year of the discovery in his list of memorable dates. The forces that direct the attention of workers along certain lines and that determine the form of training needed for the study of the particular problems without which discoveries cannot be made, are often overlooked or ignored. To him who appreciates the spade work and who places a higher value on scientific truth than on the elaboration of theories, the year 1929 will be regarded as a satisfactory one.

#### The Medical Profession in Australia.

It is sometimes maintained that the medical profession in Australia is becoming overcrowded and that it is undesirable for the rate of increase to be accelerated. The available figures have been published in the Education Number of THE MEDICAL JOURNAL OF AUSTRALIA of August 31, 1929. A study of the annual returns of the three medical schools reveals that after the war the number of first year students decreased very materially and reached the lowest point in 1924 and 1925. The result of this is now becoming apparent. Since then there has been a slight recovery, but difficulty is still being experienced in finding young graduates to fill the positions of resident medical officers at the

public hospitals and other medical institutions. In 1929 the number of available graduates has been insufficient for the requirements of the Commonwealth. While it is obviously an advantage for every young graduate to serve for a year in a general hospital under the control of a competent teacher, it is beneficial for the institution if there are more candidates than positions, so that the most distinguished students may be selected. The time has come when the demands should be met by our own medical schools. More undergraduates in medicine are needed, so that it should not be necessary to look to the old country to supply a large contingent of medical practitioners each year. Mention should be made of the fact that the growth of specialism and the creation of extra positions in the public services provide ample opportunity for an increasing number of medical practitioners, after they have served as resident medical officers at one or more of the large or small public hospitals.

#### The British Medical Association.

An event of some significance to the several Branches of the British Medical Association in Australia in the year that has just closed, was the visit of Sir Ewen Maclean, the immediate past President of the association. This visit was a gesture of friendliness and interest on the part of the parent body. Sir Ewen Maclean attended the third session of the Australasian Medical Congress (British Medical Association), Sydney, 1929, as the official delegate of the British Medical Association.

The Federal Committee of the British Medical Association in Australia has now finalized the task of drafting the constitution of the Federal Council. The memorandum and articles of association and the by-laws have been in the lawyers' hands for some time and at its last meeting the Federal Committee approved of the form and amended certain details, so that the document is now in the press. It will be published in an early issue of this journal. The approval of the Council of the British Medical Association will be sought. When this has been done, it will be necessary to obtain registration of the Council under the provisions of the *Company's Act* of one of the States. This action of the Federal Committee in giving effect to the wishes of the

Branches in regard to the formation of the Federal Council is of considerable importance. If the Branches endow the new Council with reasonable powers of initiation and executive action, the defects of the slow moving Federal Committee will be remedied and the development of the Branches as instruments for the promotion of medical knowledge and for the maintenance of the dignity and interests of the medical profession will be considerably enhanced.

The Federal Committee has completed another task of some importance during the year. The model rules governing procedure in ethical matters have been revised and in their amended form have obtained the approval of the Branches and the sanction of the Council. Although no Branch is compelled to adopt these rules, the Council has intimated that it is thought to be eminently desirable for all the Branches to adopt them.

The Gold Medal of the British Medical Association in Australia has been awarded to Dr. W. H. Crago for his long and valuable services to the New South Wales Branch and to the medical profession throughout the Commonwealth.

The Queensland Branch has taken a bold step in revising the conditions of friendly society lodge practice. The new standard agreement has been adopted in the metropolitan area of Brisbane and is being introduced in all other parts of the State. The negotiations have been conducted without bitterness and it is anticipated that the medical service under the revised conditions will be appreciated by the members of the lodges and will be satisfactory to the members of the medical profession.

The Victorian Branch has introduced a novel expedient for the purpose of giving effect to the views and requirements of members practising in districts far removed from the metropolis. Representatives of the several subdivisions will meet from time to time and will consider those problems that concern medical practitioners in all parts of the State, in order that the policy may be adapted to peculiar conditions of every district. The experiment will be watched with great interest, since it is the nearest approach to the Representative Meet-

ing of the British Medical Association that has hitherto been introduced into Australia.

All the Branches of the Association in Australia have carried out their functions with energy and adroitness during the year and each has become increasingly useful not only to its own members, but also to the community at large.

#### The Universities.

More interest and activity has been awakened in the recent election of members of the Senate of the University of Sydney than in previous years. A strenuous attempt was made by graduates in medicine to secure representation for the large teaching hospitals. It failed, partly because it is widely held that localized interests of this kind have no justification and partly because the majority of the electors manifestly do not desire any radical change in the policy of the university. The incident, however, reveals the beginnings of a movement of reform which will probably continue and become more powerful. In the Medical Faculty there have been a few events of importance. The appointment of Dr. Whitridge Davies to the chair of physiology has come as a surprise. His qualifications for the position are admirable and his record is an excellent one, but the Senate appears to have overlooked the fact that Associate Professor H. Priestley has worked in the department for several years, that while he was associated with Professor H. G. Chapman and since he has had sole control he has organized the teaching in a very satisfactory manner and has proved himself exceptionally competent to fill the chair which he has occupied in a temporary capacity for so long. The Bosch Professors of Medicine, of Surgery and of Bacteriology have not yet been appointed. The personnel of the committee appointed to consider the applications has been published. We have directed attention to the anomaly of offering a salary of £2,500 a year to the Professors of Medicine and of Surgery and of restricting the salary offered to the Professor of Bacteriology to £1,500.

At the end of the year Professor D. A. Welsh resigned his position of Dean of the Faculty of Medicine and Professor J. C. Windeyer has been appointed in his stead.

In Melbourne certain changes have also been effected during the year. Professor R. J. A. Berry having resigned his chair and the deanship of the Faculty of Medicine, was given final leave of absence and is now in England. Professor F. Wood-Jones has accepted the chair of Anatomy. The appointment gives great satisfaction. Professor Wood-Jones came to Adelaide in 1920 with a great reputation as an anthropologist, a philosopher and a morphologist and that reputation was enhanced when he vacated the Elder Chair of Anatomy in 1927. The appointment of Dr. R. Marshall Allan as Professor of Obstetrics in the University of Melbourne earlier in the year gave rise to the whole hearted approval of the medical profession and of sociologists outside the profession. When Professor Berry vacated the office of Dean of the Faculty of Medicine, his position was filled by Professor W. A. Osborne. At the present time Professor Peter MacCallum is acting Dean.

The Medical School of the University of Adelaide has sustained a severe blow by the resignation of Professor H. H. Woollard, Elder Professor of Anatomy. Professor Woollard had a difficult task to fulfil since his immediate predecessor was Professor Wood-Jones. But his ability, his determination to bring his department into the closest touch with the clinical side of the school and his wide grasp of the academic and the applied aspects of anatomy and morphology at once removed all doubts from the minds of his colleagues and his students. He has been appointed to an important chair at Saint Bartholomew's Hospital, University of London, and it is not surprising to learn that the smaller school was unable to hold him. The appointment of a successor is awaited with impatient interest.

There are indications that a medical school may be established in Brisbane within the near future. At the present time a small school of anatomy is serving the needs of students of dentistry and of some medical practitioners. A considerable amount of provisional discussion and preliminary work has been undertaken and progress has been registered.

The building of the new University of Western Australia is proceeding and it is anticipated that

by 1931 a modern university will replace the temporary establishment in Perth. Although it is unlikely that a medical school will be instituted for some time, it is a safe prophecy to state that the university will provide education in the fundamental sciences for medical students in the course of a few years.

#### Australasian Medical Congress (British Medical Association).

The third session of the Australasian Medical Congress (British Medical Association) took place in Sydney during the first week of September, 1929. About one thousand members joined the session. The programme included a meeting of the whole congress for the purpose of recording what had been done in Australia in connexion with research into the problems of cancer. The chief interest was focused on the Cancer Research Committee of the University of Sydney. Although the speeches contained records of the organization of the several bodies engaged in research into the causation of cancer and in the standardization of treatment and no new facts were brought to light, the discussion served a useful purpose. Each speaker laid emphasis on the aspect which appeared to him most worthy of investigation and at the same time summarized the endeavours that had been made to gain a control over the malignant diseases in his city. The work in the sections covered a wide field. A great deal of the material offered was of good quality and represented deep thinking and arduous work. The organization of the session was in the hands of Dr. T. W. Lipscomb and Dr. A. A. Palmer, the honorary general secretaries. Unstinted praise has been accorded to them for the manner in which they conducted their tasks.

Several of the Branches have intimated that they would be prepared to hold the fourth session in their respective capital cities in 1931. The Federal Committee will consider these invitations at its next meeting.

#### Preventive Medicine.

The building of the new school of Preventive Medicine and Tropical Hygiene within the grounds of the University of Sydney is approaching completion. It will be opened in March, 1930. Dr.



Harvey Sutton has been appointed Director of the school. The work of organization has occupied his attention for some time and is, we understand, well advanced. Further information concerning the school will be published at the time of the official opening.

No important innovation has been introduced during the year by the Commonwealth Department of Health. The progress that has been achieved, has been steady and useful. The Division of Industrial Hygiene sustained a serious injury by the death of Dr. D. G. Robertson, the Director. His place has now been filled by Dr. K. R. Moore, whose work in other branches of preventive medicine is well known.

The most important event in the local control of health that has to be recorded, is the revival of the position of medical officer of health for Greater Brisbane. Grave exception was taken to the removal of the previous medical officer and the abolition of his office. It is a matter of congratulation that this unwise action has at length been remedied.

#### Post-Graduate Work.

The Melbourne Permanent Committee for Post-Graduate Work has continued to provide admirable courses and special lectures in Victoria. The New South Wales Branch of the British Medical Association has recently appointed a special committee to organize post-graduate courses, lectures and special courses on a well thought out plan. The committee will also act as an information bureau to advise medical practitioners as to the best means of obtaining post-graduate training at all times. It is anticipated that the movement will lead to much improved conditions in Sydney. Sir Ewen Maclean, while in Australia, discussed the question of adequate provision of courses for Australian practitioners visiting England. He was assured that any movement to organize post-graduate teaching on sound lines in London and the provincial cities of England and in Scotland would be greatly appreciated by Australian practitioners. At the present time post-graduate work is not highly developed in England and it is felt that if a strong demand were created, some organization would be brought into existence in order that first class

facilities might be provided in London. We expect to learn more of this movement in the near future.

#### Obituary.

Death has removed many very prominent medical practitioners in Australia during the year 1929. George Adlington Syme, the acknowledged leader of the medical profession in the Commonwealth, died on April 19, 1929. The whole profession gave evidence of its profound regret. Among the many names of eminent medical men who have been taken from us during the year are Frederic Dougan Bird, Athelstan John Henton Saw, Charles Stanser Bowker, William Thornborough Hayward, Arthur Murray Oram, Duncan Glenorchie Robertson, Francis Washington Everard Hare, Herbert William James Marks, William Trethowan, Robert Louis McAdam, Norman John Dunlop, Bernard James Newmarch, James Ramsay Webb, Hugh Lathrop Murray. The list is an unusually long one and many not named above have left unfilled places in the medical profession. Mention must be made of one who achieved great eminence in the world of geo-physics and seismology, Edward Francis Pigot.

#### The Allied Sciences.

In recent years the liaison between the medical profession and the profession of dentistry has become a close one. The doctors and the dentists often hold joint meetings for the discussion of problems of interest to both. Similarly the veterinary profession has established intimate relations with the medical profession. Many of the problems in pathology are common to animals and to man and in some matters the study of disease processes can be undertaken to better advantage in the lower animals than in man. Meetings of the members of the two professions are becoming common. In the course of the last few years the medical profession has found it necessary to approach the chemist and the physicist for assistance in several of its problems. During the past twelve months and more we have included among the articles published in this journal a few on the physics of X radiation and on the physical chemistry of animal tissues. That it will be necessary for the medical practitioner of the future to have a good working knowledge of these allied sciences cannot be doubted. The year 1929

has produced ample evidence of the truth of this contention.

#### Hospitals.

THE attitude of the medical profession in regard to medical attendance on persons other than those without means in public hospitals is gradually being defined. Formerly the policy was generally accepted that the public hospitals should be reserved for the necessitous and that gratuitous service should be given as an act of humanity. Since the claim has been made that everyone has a right to admission to hospitals, the medical profession has had to face a problem somewhat difficult of solution. The honorary medical officers are appointed to look after the poor when illness or accident renders medical attention necessary. Since modern forms of treatment have become costly, it is clear that many people who formerly would have been able to pay for medical treatment outside the hospitals, are now compelled to seek admission. They pay the hospital authorities for their maintenance. If they can afford full fees, they can have no claim to the charity of the medical profession. It would be opposed to the general principles of the profession to permit a paying patient to be admitted to the care of a member of the staff of an institution without giving the patient the right to select his or her own medical attendant. It therefore follows that in private hospitals and in private wards of public hospitals medical practitioners must be allowed to continue the medical charge and treatment of their patients. But when the patient is able to pay a fraction of the full fees, the solution is not so easy. In Victoria it has been determined to sanction an experiment at certain selected institutions outside the metropolis. Those patients who can pay something toward the cost of treatment, are to be treated by their own medical practitioners in special wards. Safeguards are to be introduced, so that the expedient may not prove detrimental to the institution. The policy in New South Wales is still undefined, although the basis for a policy appears to be recognized. Moreover, it has been determined as a matter of principle some time ago that the policy of the British Medical Association should be followed, by requiring that the payments made

by patients for their maintenance in hospitals should include an aliquot part for treatment and that this sum should be paid by the hospital authorities into a medical officers' fund, to be used in such manner as the members of the staff determine. The advent of the new *Hospitals Act*, the appointment of the Hospitals Commission and the formulation of a policy by its chairman have modified the position to some extent.

In Queensland a Royal commission on hospitals is to be appointed and it is hoped that the interests of the medical profession and of the public will be safeguarded. Less difficulty is being experienced in Western Australia. In South Australia the views of the medical profession are similar to those held in New South Wales and in Victoria. No final settlement of the hospital difficulty has yet been attained in Hobart.

#### The Australasian Medical Publishing Company, Limited.

The attention of the members of the several Branches of the British Medical Association in Australia was called in September to the fact that in common with other printing establishments in Sydney The Printing House has felt the effect of the financial and industrial depression during the past twelve months and more. The plant was not working at its full capacity during the year ended June 30, 1929, although a large amount of scientific matter was being produced. The balance sheet showed a profit, but the amount was insufficient to enable the Directors to pay the interest on the debentures. Other firms that have been established for many years, are in the same position. Those best able to judge were satisfied that there was no cause for alarm, but that in the course of a couple of years the difficulties would be overcome. We have pointed out that the medical profession has not supported The Printing House by ordering stationery and other printing in the past. The house has been established for the specific purpose of producing THE MEDICAL JOURNAL OF AUSTRALIA and the publications of scientific and educational organizations. The medical profession could render it unnecessary for the management to seek work of a commercial nature, work that was not contemplated when the house was planned and the staff engaged.

## Abstracts from Current Medical Literature.

### MEDICINE.

#### Albuminuria in Malaria.

RICHARD GREEN (*Malayan Medical Journal*, June, 1929) records the results of examination for albuminuria in 300 male adults admitted into the district hospital at Kuala Lumpur for treatment for malaria. Albuminuria was classified as mild or severe, according to the quantity of albumin in the urine. As a rule in mild albuminuria albumin was not constantly present; in those classified as severe albumin was found at every examination. Of 70 patients suffering from benign tertian malaria, 24.3% had mild and 1.4% severe albuminuria; 37.1% of 159 sufferers from malignant tertian malaria had mild and 5% severe albuminuria; 49.3% of 71 quartan malaria subjects had mild and 9.9% severe albuminuria. Some of these patients no doubt were affected with albuminuria before they contracted malarial infection, but this fact would not influence the relative results to any great extent. The administration of quinine is said to induce albuminuria; as all patients concerned in these investigations received the same quantity of quinine, the relative results again would not be greatly affected thereby. The most severe illness occurred in those patients who were infected with *Plasmodium falciparum* and this may have tended to raise the incidence of albuminuria among the sufferers from subtertian malaria. The part played by malaria in the causation of nephritis is difficult to determine. Tests of renal function before and after attacks might yield some information on this point. The possibility that malaria might cause further harm to kidneys, already damaged by disease, should be borne in mind.

#### Secondary Infections and Filarial Lymphangitis.

H. W. ACTON AND S. SUNDAR RAO (*Indian Medical Gazette*, August, 1929) express the opinion that acute lymphangitis in filarial infestation always has as its source a septic focus. Lymphatic obstruction in filarial disease may be a chronic condition resulting from the damage done to the lymphatic glands by the worms passing through them. Again, obstruction may be acute, depending on an acute inflammation, caused by the invasion of damaged glands by pyogenic cocci. In the Carmichael Hospital for Tropical Diseases, Calcutta, a septic focus was found in every one of twenty-eight patients suffering from acute symptoms of lymphangitis or abscess following lymphangitis, elephantiasis or chyluria. Foci were either external or internal. The external foci, usually temporary, were, for example, traumatic lesions or tinea infections with secondary strepto-

coccal invasion. The internal foci were more permanent and consisted of such conditions as *pyorrhœa alveolaris*, periodontitis, septic tonsils, intestinal ulceration *et cetera*. The same coccus can be recovered from the inflammatory site as from the septic focus and it can usually be recovered from the urine also, thus indicating invasion of the blood stream. Eradication of the septic focus, followed by immunization, prevents periodic attacks and the development of elephantiasis.

#### Purpura Hæmorrhagica.

K. P. A. TAYLOR (United Fruit Company, Medical Department, Seventeenth Annual Report, 1928) reports the apparent cure of a patient suffering from *purpura hæmorrhagica* by the administration of bothropic antivenene. The patient was a white male, aged twenty-one years. The body temperature was raised above normal, the pulse was rapid and became feeble during the course of the illness, there was profuse hæmorrhage from nose and gums. Hæmaturia, melæna and hæmatemesis were observed. The sites of hypodermic injections on the legs and arms were purpuric. There was only one spontaneous purpuric area which was one centimetre in diameter and was situated on the left thigh. No malarial parasites were found in the blood. The injection of "Hæmostatic serum" and calcium chloride solution had no apparent effect; the local application of adrenalin appeared to be valueless. Within two hours following the intramuscular injection of ten cubic centimetres of bothropic antivenene, bleeding from nose and gums had ceased. Red corpuscles and hæmoglobin were detected in the urine for two succeeding days. Convalescence was uneventful and the patient was discharged thirteen days after admission.

#### Catarrhal Jaundice.

M. GARNIER (*La Presse Médicale*, February 27, 1929) discusses the morbid state spoken of as catarrhal jaundice. Jaundice of rather rapid onset and varying intensity is well recognized when due to certain toxins or infections. A similar condition has long been regarded as catarrhal jaundice and considered as due to inflammation spreading up the bile ducts from the duodenum or to a plug of mucus blocking the bile passages. *Post mortem* examinations in this condition are extremely rare, hence the lack of confirmation of these supposed causes. In investigating the symptoms, however, it is found that the clay coloured stools which are a sign of this type of jaundice, do not appear coincidentally with the onset of jaundice, but are delayed several days and that the stools often regain their normal colour, while definite jaundice still exists. Further, though the experimental injection of many organisms into the bile duct produces acute angiocholitis, it does not cause jaundice. To induce jaundice it is necessary to inject certain specific icterus producing organisms. These

bacteria act in two ways; they cause increased hæmolysis of red blood cells and they display an affinity for the bile substances, the results of which offer a chemical explanation of the deviation of the bile stream. Infective jaundice in its simpler forms is quite independent of any inflammation of the bile ducts. It is possible that as a result of the type of jaundice under discussion secondary invasion of the bile passages may occur, with resultant inflammation. This secondary infection may be the cause of intermittent febrile disturbances and a blood culture may at this stage reveal a colon type of bacillus, but this occurs after the lapse of some time and is a result and not the cause of the jaundice. It is maintained that in no case is the jaundice due to the localization of an infective agent in the bile passages and that the term catarrhal jaundice is a misnomer. Acute non-febrile jaundice is suggested as a name which describes the clinical condition and does not postulate the nature of the pathological state which is at present uncertain.

#### "Pneumococcus Immunogen Combined" in the Treatment of Pneumonia.

G. B. BHADURI (*Indian Medical Gazette*, June, 1929) publishes his results from the use of "Pneumococcus Immunogen Combined" (Parke, Davis and Company, Limited) in the treatment of lobar pneumonia in Sambhunath Pundit Hospital, Bhowanipore, Calcutta. "Immunogen" was given every day in doses of 0.5 to 2.0 cubic centimetres according to the severity of the disease and the condition of the patient, until the subsidence of the fever. Of thirty-four patients treated with "Immunogen," 35% died, while of forty-three who received no "Immunogen," 58% died. When "Immunogen" was used, there was no crisis. The author regards the results as satisfactory and states that "Immunogen" is now used as a routine in the treatment of lobar pneumonia in the Sambhunath Pundit Hospital. The high death rate he attributes to the fact that his patients belonged to the poorer classes and often presented themselves for treatment only when desperately ill.

#### Rheumatic Fever.

C. L. DERICK, C. H. HITCHCOCK AND H. F. SWIFT (*Canadian Medical Association Journal*, April, 1929) discuss the allergic conception of rheumatic fever. Different varieties of streptococci have been isolated from the blood and organs of patients with rheumatic fever. It is held that the rheumatic fever patient is in a state of hypersensitiveness to certain streptococci owing to receiving repeated small doses of these organisms; an acute focal infection of the tonsils, pharynx or sinuses occurs and this induces joint swellings, fever *et cetera* as allergic manifestations. This view is favoured by studying allergy to streptococci in rabbits. When a normal rabbit is inoculated intradermally with *Streptococcus viridans*



or other streptococci, an immediate reaction occurs which decreases in three to five days. If such an animal is reinoculated intradermally at suitable intervals, it manifests an increasing reaction to the same dosage. The lesions produced resemble those of *lupus vulgaris* and of the nodular syphilides. If the conjunctiva of the hypersensitive animal is lightly scarified and inoculated with the streptococcal culture, definite conjunctivitis and keratitis occur. When a hypersensitive animal is inoculated intravenously with these organisms in doses innocuous to normal animals, it becomes ill and often dies in forty-eight hours. At autopsy such animals have enlarged hæmorrhagic lymphatic and thymus glands with hæmorrhages into Peyer's patches, bone marrow, heart and lungs.

#### Asthma.

M. B. COHEN (*Journal of Laboratory and Clinical Medicine*, June, 1929) discusses asthma due to household articles. Samples of dust were collected in paper bags by means of a vacuum cleaner from pillows, rugs, mattresses and other household furniture which harboured dust. The dust was collected in bottles and covered with Bernton's fluid for forty-eight hours, then it was filtered and used to test the patient by the scratch method. At least a teaspoonful of dust was collected from each article. Among 200 asthmatic subjects 19 gave definite reactions to dust in this way, though they did not react to cotton wool or kapok. Complete relief was obtained by discarding the offending object, for example, a mattress. In three patients asthma recurred after three or more months and a test carried out with dust from the new mattress yielded a positive result. It was found that covering the offending mattress with impervious rubber sheeting or Dupont's satin fabricoid gave relief. It is suggested that the mattresses become infected after a time with moulds which give rise to asthma.

#### Calcification of the Vessels in Diabetes.

L. B. MORRISON AND I. K. BOGAN (*Journal of the American Medical Association*, April 27, 1929) conclude that calcification of the vessels may be associated in *diabetes mellitus* as an ætiological factor. The incidence and degree increase with age and with the duration of the disease. Blood pressure in this series increases with age, but not with duration. Röntgenological examination is of greater value in judging the presence of calcium in the vessel walls than clinical methods.

#### Radicular Syndrome.

L. GUNTHER AND W. J. KERR (*Archives of Internal Medicine*, February, 1929) describe thirty cases and discuss the radicular syndrome in hypertrophic osteoarthritis of the spine. Tingling, numbness and anaesthesia are common in the fingers and in other root distributions. Paræsthesiæ such as burning, aching, tightness, heaviness, fullness *et cetera* are

frequent symptoms in all parts of the body. These symptoms are bilateral as a rule and have a definite root distribution. Careful inquiry is necessary to establish these points. Minor degrees of anaesthesia to cotton wool and pin prick are noted and hyperæsthesia is frequent in root areas. Such symptoms are referable to all parts of the body and often simulate diseases of internal organs of the thorax and abdomen. Headache referred to the neck and occiput is frequently due to radiculitis of the first to the third cervical nerves, the result of pressure. Movement of the affected part nearly always aggravates the symptoms. X ray examination helps to confirm the diagnosis in most instances.

#### Pneumonia.

B. M. RANDOLPH (*Archives of Internal Medicine*, February, 1929) discusses the cardio-vascular problem in pneumonia. He does not agree that digitalis is productive of any good; the heart in pneumonia is working at full pressure and direct stimulation with digitalis can do no good. The primary toxic effect in pneumonia is on the peripheral blood vessels through the vasomotor system. There is an oxygen hunger of the tissues, including the myocardium and frequently oxygen administration even in adequate amounts produces no good effect because the tissues are unable to absorb more oxygen owing to the toxic state. Blood letting, 300 to 600 cubic centimetres, repeated if necessary, is most effectual and should be performed early. It appears to have more than a purely mechanical effect in lessening the load on the right side of the heart. Caffeine is ineffective and often causes restlessness and insomnia. Camphor in oil is a temporary stimulant and may tide the patient over a crisis. Whisky seems to soothe the patient and to help to induce sleep. Epinephrine is too transient in its effects and stimulates the heart muscle too much. Pituitary extract seems to hold out most hope as a stimulant, but it has no effect on the toxæmia. In the Washington district it is held that the *Streptococcus hæmolyticus* or *viridans* is responsible for more cases of lobar pneumonia than the pneumococcus and that the pneumonia due to these organisms is not a self-limited disease like pneumococcus pneumonia; termination is often by lysis. Administration of citrates and acetates of sodium and potassium seems to modify the disease somewhat, if adopted early.

#### Narcotic Addiction.

C. W. SCHILL (*Medical Journal and Record*, February 20, 1929) records his experiences of the use of "Narcosan" for narcotic addiction. One thousand seven hundred patients were studied, mainly of the criminal class. "Narcosan" was injected intramuscularly every four hours for the first three days of treatment; 0.6 mil (ten minims) was the initial dose and this was gradually increased. The treatment lasted twelve to fourteen days,

following a cathartic and a saline laxative. Sodium bicarbonate 2.0 grammes (thirty grains) in 120 to 180 cubic centimetres (four to six ounces) of water was given every three hours at the beginning of treatment. This drug was especially useful for nausea, vomiting, diarrhoea and cramps which often occurred on withdrawal of the drug to which the patient was addicted. Morphine, heroin and other opium derivatives and cocaine were the substances to which the patients were addicted. Complete withdrawal of the drug was indicated rather than gradual withdrawal. Treatment was carried out in an institution. "Narcosan" is a solution of lipoids, non-specific proteins and water-soluble vitamins prepared from plant seeds. The results in the majority of cases studied were much superior to those obtained by other methods; "Narcosan" relieved the craving for narcotics. It is suggested that morphine and other narcotic drugs provoke the formation in the body of antisubstances and that when the narcotic is withdrawn, the antisubstances give rise to the nervous and other symptoms. "Narcosan" is said to counteract these antisubstances.

#### The Initial Lesion in Pulmonary Tuberculosis.

ALBERT GIRAUD (*La Presse Médicale*, October 16, 1929) endeavours to adjudicate in the controversy which exists at present on the site of the earliest demonstrable lesion in pulmonary and hilar tuberculosis. He reviews the present conflicting doctrines. First, he discusses the sub-clavicular infiltration of Assmann and decides that this is a rare commencement, but, being easily diagnosed by reason of its accessibility, it appears more common. Secondly, he reviews the hilar tuberculosis of Léon Bernard and admits that it represents one clear type of initial lesion. Lastly, he refers to the old theory of an initial apical infection, strongly held yet by many. To them the sub-clavicular lesion is secondary and the lesion thus becomes more important and more serious as it extends down the lung. Radiologically it may appear to be of maximum condensation in the hilar region and hence there results the error of hilar origin. The author concludes that, though there are zones of election, tuberculosis commences in the lungs wherever it pleases and that it is therefore advisable to search for it both clinically and radiologically without bias in every part of the lung. As these zones of election undoubtedly exist, the final word as to their site has yet to be spoken. The author believes that the answer will be found when experimental research has been done by the radiographers and the pathologists working in close cooperation, it being the part of the pathologists either to confirm or to reject the findings of the radiologists. To radiology he gives the credit for the present controversy, as it has thrown much new light on this as on many other problems in pulmonary tuberculosis.

## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Darling Building, University of Adelaide, on September 26, 1929, Dr. H. GILBERT, the President, in the chair.

#### Heart Disease and Pregnancy.

Dr. F. S. HONE read a paper entitled: "Heart Disease and Pregnancy" (see page 2).

Dr. W. A. VERCO read a paper entitled: "Pregnancy and Heart Disease" (see page 6).

Dr. BERNARD DAWSON, after thanking Dr. Hone and Dr. Verco for their valuable and suggestive papers, discussed the indications for the termination of the pregnancy of women suffering from heart lesions. In his opinion serious breakdown of compensation during the first four months of a first pregnancy which was unrelieved by a fair trial of adequate medical treatment, was sufficient justification for interrupting the pregnancy. By a fair trial he meant one of ten days to a fortnight; if this did not result in marked improvement in the cardiac condition, further delay was dangerous. Due regard had to be given to the deleterious effects of vomiting that might be expected to cease after the third month.

In *multiparae* a history of grave cardiac distress in a previous pregnancy associated with an early breakdown of compensation in a current one was an indication for emptying the uterus. After viability of the child in both *primiparae* and *multiparae* progressively increasing evidence of decompensation, in spite of conservative treatment, was a justification for terminating the pregnancy. In these circumstances after viability the method of achieving this object rested between induction of labour and Caesarean section. Induction had several drawbacks, the most important of which were the repeated manipulations necessitating anaesthesia which were frequently required, and the fact that such preliminary manoeuvres had still to be followed by the efforts of labour. On the other hand, Caesarean section was an operation that could be performed rapidly, with quite moderate loss of blood, without any exertion on the part of the mother and with perfect safety. The most important detail was the choice of anaesthesia. This should be either spinal or gas and oxygen; of these the latter was the better. Even the most successful spinal anaesthesia inflicted considerable apprehensive distress upon the patient which was probably more harmful than the effects of the inhalation of gas and oxygen. This seemed to be the ideal method for the purpose and, properly administered, was entirely adequate.

Another type of heart dysfunction that was of great importance was that which was secondary to renal disease. The chronic nephritic woman who became pregnant, suffered an aggravation of her renal incapacity. In the majority this was manifested by a breakdown of kidney efficiency as revealed by symptoms, by nitrogen retention and by poor response to renal efficiency tests. There was, however, a small minority of such patients who suffered from cardio-vascular rather than renal failure. These women had a high blood pressure of 180 millimetres of mercury upwards, cardiac hypertrophy which deteriorated into dilatation, and often ocular signs, whereas their blood urea might be no more than 40 milligrammes per hundred cubic centimetres and their urea concentration test figure as much as 2%.

Dr. Dawson regarded such conditions as extremely grave and requiring prompt treatment as soon as any signs of decompensation appeared. If conservative medical treatment failed to produce improvement quickly, the uterus should be emptied by Caesarean section under gas and oxygen anaesthesia. In institutional work during the past two years he had had three such patients whose condition was so grave and critical that any delay was dangerous. Two of these women had been treated by Caesarean section at about the seventh month with very satisfactory results,

whereas the third had been treated expectantly until the onset of premature labour at the sixth month. This patient had died of sudden cardiac failure during the second stage of labour.

Dr. Dawson thought that their attitude to the question of interrupting pregnancy was influenced too much by mortality and not enough by morbidity. The very proper strictness of professional procedure in this regard was apt to limit their purview to the question of the mother's life, whereas she was entitled to careful consideration of her future health. In this respect he would like to quote the considered opinion of one of England's greatest law lords, Lord Riddell, who, referring to "Midwifery by Ten Teachers," pointed out that therein was stated that operations for the termination of pregnancy were confined to occasions when the life of the mother would be endangered or her health likely to be permanently damaged by the continuation of the pregnancy. Lord Riddell thought the word permanent inaccurate. Induction was not only justifiable, but a duty when the pregnancy indicated grave danger to the mother's health, whether the result was likely to be permanent or not. Every medical man was familiar with patients whose complicated pregnancy had been precariously piloted to term with unfortunate results to the mother's future well-being. Such deliveries might be regarded as triumphs for the obstetrician, but they were often personal disasters for the patient.

Dr. ROLAND BEARD remarked that the greatest problems with regard to decompensation were often associated with *primiparae*. The first child was often the most difficult and the most desired. There must be cooperation between physician and antenatal obstetrician. Emptying of the uterus was no remedy of itself for failure of compensation, as sometimes death followed several days later in the puerperium. The uncertainty of how a patient might shape should be explained to her and she should be given her choice. Of all pregnant women 1% had rheumatic hearts. Any estimate of the heart's capacity was seriously affected by the unpredictable factors of childbirth, for example, intercurrent affections such as influenza, pneumonia, difficult labour, toxæmia and puerperal infection. He maintained that these were matters for grave consideration. The most important prognostic factors were rhythm and size of the heart. When failure occurred during pregnancy, the heart should first be treated and then the pregnancy. Pregnancy in a patient with a serious cardiac defect might sometimes in the early months be best treated by a subtotal hysterectomy. For failure during the first half of pregnancy solid rubber bougies, hollable and the size of a lead pencil, offered advantages without an anaesthetic. During the second half similar bougies, only larger, might sometimes be used, preceded by the use of Hegar's dilators. There was a risk in allowing such patients to go to term, because pulmonary oedema sometimes developed. Failure late in pregnancy with fibrillation was said to be more favourable than failure with a regular rhythm. Prolonged rest after all forms of delivery was most important to avoid heart strain. Delivery near full term was sometimes safer by Caesarean section under gas and oxygen, ethylene or morphine and scopolamine and spinal anaesthesia. There was a danger of fatal bronchitis with inhalation anaesthesia. In all cases he wished to emphasize the importance of close cooperation between physician and obstetrician.

Dr. BRIAN SWIFT agreed with Dr. Hone and wished to emphasize what Dr. Hone had said with regard to functional heart lesions in the later months of pregnancy. During the previous year he had had several of such patients who had been reporting at the antenatal clinic at the Queen's Home. He had watched these patients through their pregnancy and labour. Towards the later months they had complained of shortness of breath. On inspection they had had a dusky bluish complexion with bluish lips. This condition had suggested that their hearts were feeling the strain of pregnancy and were about to break down. However, on examination the heart sounds had been usually normal, but in a few instances a systolic murmur had been heard over the mitral area, but the murmur had not been heard at every examination. The condition had caused a certain amount of anxiety, but Dr. Swift had found that the patients suffered no ill

effects during labour and that they appeared to recover completely.

With regard to the emptying of the uterus of patients with heart disease, Dr. Swift said that it appeared to him that there was no definite rule, neither was there any test or examination which could be applied and which really indicated the condition of the heart muscle. Dr. Swift considered that the rule for emptying the uterus of patients with heart disease was the same as of patients with active tuberculous lesions of the lungs, namely, that the uterus should not be emptied after the patient was three months pregnant. If the heart lost compensation before three months, then the uterus could be emptied at one operation, but if after three months, then the heart should be treated by rest and drugs and if necessary Cæsarean section could be done at term. Dr. Swift pointed out that X ray pictures of the chest were of great help during the first three months of pregnancy in deciding whether the heart was about to lose its compensation. By taking a series of pictures every week the condition of the bases of the lungs could be noted and at the first sign of congestion the uterus could be emptied. It was found that X rays gave evidence of this congestion much earlier than clinical methods and also that when compensation was beginning to be lost during the first three months, the heart always broke down in the later months; patients therefore ran a grave risk if the pregnancy were allowed to continue. Dr. Swift asked the physicians present their opinion on this examination.

Dr. Brian Swift also showed a patient on whom he had performed Cæsarean section on account of a decompensated heart lesion. This case is reported in this issue at page 19.

DR. GILBERT BROWN considered that in some of these patients with severe cardiac lesions the correct anæsthetic was the deciding factor in recovery. Chloroform was definitely contraindicated and ether was cardiotoxic and apt to cause salivation. Ethylene and oxygen or nitrous oxide and oxygen were non-toxic, gave a rapid induction, caused very little variation in the blood pressure and permitted a rapid recovery. The child was not depressed in any way. Certain cardiac patients could not stand the strain of labour pains and in elderly *primiparæ* with slow dilatation of the cervix, the safest treatment was Cæsarean section under one of the gas anæsthetics. Lantern slides of blood pressure charts were shown which clearly demonstrated the very slight variation in pulse rate and blood pressures during this procedure. The first was the record of the patient shown by Dr. Brian Swift. The second was of a patient of Dr. Moulden, a woman with a failing heart caused by high blood pressure. When the anæsthetic had been begun, her pulse rate was 120, her systolic blood pressure was 240 and her diastolic pressure 150 millimetres of mercury. After Cæsarean section and ligature of the Fallopian tubes under nitrous oxide and oxygen anæsthesia the pulse had been 108 and the systolic blood pressure 224 and 130 millimetres respectively.

Dr. Brown also referred to "Avertin" anæsthesia which had been extensively used in Germany and which might be useful in guarding patients with severe heart disease from the additional strain of painful labour.

DR. OWEN M. MOULDEN reported a case of pregnancy complicated by myocardial failure resulting from hyperpiesia, in which the treatment of election was Cæsarean section performed under nitrous oxide and oxygen anæsthesia. He had already reported this case in the issue of December 22, 1928, of THE MEDICAL JOURNAL OF AUSTRALIA, but it was thought appropriate to present it again at the present discussion.

#### Magill's Laryngoscope.

DR. GILBERT BROWN demonstrated Magill's direct laryngoscope which had been specially devised to facilitate the introduction into the trachea of catheters and expiratory tubes. It had the following distinctive features: (i) An unusually wide slot which was at the side and required no shutter to close it when in use; (ii) flat and slightly upturned extremity, providing easy control of the epiglottis; (iii) effective illumination from a durable lens-fronted electric bulb; (iv) stainless steel which was

strong, easily cleaned and had no plating which might chip off. The laryngoscope was passed from the side of the mouth and was easier to use than the Chevalier Jackson model, could be used with larger tubes and, having no sliding parts, was less likely to get out of order.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Royal Prince Alfred Hospital, Camperdown, on August 8, 1929. The meeting took the form of a series of clinical demonstrations.

#### Huntington's Chorea.

DR. J. A. L. WALLACE showed a male patient, aged fifty years, who had been admitted to Callan Park Mental Hospital on July 27, 1928, suffering from organic dementia and coexistent Huntington's chorea. The patient's father had suffered from Huntington's chorea. The patient was one of triplets; one of the children had been killed as a boy and the other had become affected by chorea after the age of forty years.

The patient had never been bright at school. He had worked on his father's farm and had come to Callan Park as an attendant at about twenty-four years of age and had remained twelve months. Subsequently he had managed a butcher's business and had done well. He had married at twenty-three years of age and had one son and one daughter who were quite healthy. He had had "bad nerves" and actual chorea for the previous ten years; for the last two or three years this condition had been almost uncontrollable. He had never expressed any suicidal tendencies or intentions, but had often struck his children, if they differed from him in the slightest. According to the medical certificates he had been restless and had sat on the bed continuously, exhibiting choreic movements; he had repeatedly clasped his face in his hands; he had stripped himself and had been violent and dangerous; he had been morbidly depressed and had exhibited suicidal tendencies; he had been orientated as to place and imperfect as to time. He was able to write his name.

At the time of the meeting the patient was in the habit of sitting about for most of the day and was more or less demented. When spoken to, he smiled fatuously, but seldom answered. He was totally unable to do any work on account of chorea. He was quiet and very amenable. He had an inguinal hernia on one side and the scar of an operation for hernia on the other. He had varicose veins in his leg.

Dr. Wallace's second patient was an engineer, aged fifty-eight years, a voluntary patient, who had been admitted to Callan Park Mental Hospital on June 17, 1929. His family history was clear. He had had but little schooling for ten to fourteen years. He had been normal as a youth and had become a marine engineer. He had enlisted in 1915 and had served in France until 1918 and had been invalided for seven weeks on account of an overdose of creosote. He had been gassed. In 1919 Huntington's chorea had become manifest and he had been in Randwick Hospital. Since then the chorea had become worse. He had been a teetotaler. No others in the family had suffered from Huntington's chorea. On admission he had been euphoric, orientated and able to give a good account of himself. He had been depressed on account of his inability to work, but had obtained a military pension and had stated that he felt well. Examination on admission had shown that he was suffering from Huntington's chorea with the characteristic facial tic and speech and with generalized convulsive movements. His blood had failed to react to the Wassermann test. The patient stated that he had taken a good deal of coffee and that this had caused the chorea. He blamed the coffee for giving him the "shakes."

#### Migraine Ophtalmoplégique.

DR. ERIC SUSMAN showed a patient who was suffering from *migraine ophtalmoplégique* (Charcot). This case was reported in full in the issue of November 30, 1929.

#### Strabismus Due to Syphilis.

DR. R. A. NOBLE showed a female patient, aged twenty-one years, who had been admitted to Lewisham Hospital



on April 11, 1929, complaining that she had suddenly begun to see double and that everything was blurry before her eyes. She had had paresis of the left abducent nerve and had been unable to turn the left eye to the left. She had also had attacks of irritability and weeping. On inquiry it had been discovered that she had had a sore on the lip four years previously. This had disappeared under local treatment by a pharmacist and nothing further had been done. Later on the family medical attendant had suggested that an examination of the blood should be made; the result had been a complete positive response to the Wassermann test. Up to the time of the meeting she had had five injections of "Tryparsamide" and was taking iodine of potash by mouth. Some improvement was being effected. Dr. Noble said that the patient's condition illustrated the way in which syphilis could pick out one nerve nucleus.

#### Cerebral Tumour.

Dr. Noble also showed a patient who had been operated on for a cerebral tumour. This report will be published in a subsequent issue.

#### Hysterical Gait.

Dr. Noble's third patient was a girl who manifested an hysterical gait. This report will be published in a subsequent issue.

#### Parkinsonian Syndrome.

PROFESSOR W. S. DAWSON showed a male patient, aged twenty-two years. The patient's maternal aunt had developed "fits" at the age of twenty-three, had become paralysed down the left side and had died at twenty-eight "with seven months' tumour of the baby." With this exception there was no history of tremors, paralysis or of symptoms suggesting hepatic disease.

The patient had been a "cranky" baby, but had developed normally and had made average progress at school up to the age of twelve. At the age of nine he had been knocked down by a motor car, but had sustained no apparent injury, had not been unconscious and had remained well for two years. There was no history of any illness suggesting encephalitis.

From the age of twelve there had been gradually increasing tremor of the left hand and foot, the right hand and the head becoming involved more recently. The left foot had begun to turn in about five years previously. From the beginning of this condition he had failed to maintain progress at school and had become dull. He had attempted to go to work at the age of fourteen, after leaving school, but could not carry on and had been unoccupied ever since. At sixteen he had been somewhat irritable and bad tempered, but of recent years he had been placid and amiable. He had been in Broughton Hall in 1927, having become much worse during the previous year. At that time his features had been dull and heavy without being definitely mask-like. Speech had been rapid and normal. The writing had been tremulous, but rounded and legible. There had been fine rapid tremors of the left arm and leg, disappearing during voluntary movement and somewhat under control, but considerably increased under the influence of excitement. There had been no rigidity or paralysis. He had had a mental age of twelve years and three months. The condition had progressed considerably since then. There was slight flexion of the trunk, the arms were held flexed on the chest to restrain the tremor. The gait was shuffling and associated movements of the arms were absent when the arms hung free by the sides. There was slight *talipes equinus* of the left foot which was also inverted. The facial expression was vacuous. The mouth was held open and the patient preferred to chew gum in order to keep it shut. He stated that his mouth was usually dry. The tremulous quality in the speech was probably due to the tremors of the head. There was no impairment of swallowing. The eye movements were normal, without impairment of convergence. There was no history of diplopia or of ocular spasm. There were coarse rapid tremors of the arms, a little more pronounced on the left side, also of the left leg. The writing was quite illegible. Wasting and rigidity were absent. The reflexes were normal and there were no

sensory changes. The patient perspired very readily. The other systems were healthy, there were no symptoms suggesting hepatic disorder. The blood gave no reaction to the Wassermann test. Tincture of stramonium in doses of one cubic centimetre (fifteen minims) three times a day had not so far been followed by any beneficial effect.

The patient was shown for an expression of opinion as to whether the condition should be put into the category of chronic encephalitis or of progressive lenticular degeneration. Perhaps the absence of eye symptoms and the coarseness of the tremors favoured the latter diagnosis.

#### Exophthalmic Goitre.

DR. MARK LIDWILL showed a female patient, aged seventeen years, who had been admitted to hospital on April 22, 1929, and who gave the history that six months previously she had noticed a swelling in the neck, that amenorrhœa had commenced and that for the last three months she had lost weight. She had lived in Queensland all her life. She had suffered from influenza seventeen months before. On examination she had been remarkably thin. Her weight had been 30.1 kilograms (four stone eleven pounds). Her pulse rate had been 120 in the minute and some exophthalmos had been present. There had been no palpitation, sweating, nervousness or tremor; in fact she had appeared perfectly normal and had never appeared the least bit excited. Her basal metabolic rate had been + 21. Her appetite had been moderately good. She had been put to bed and treated as a sufferer from exophthalmic goitre. The pulse had varied in rate between 90 and 140 in the minute and her weight had remained at approximately the same level in spite of an excessive diet. Her condition had resembled hyperthyroidism only in the fact that she had exophthalmic goitre and a rapid pulse. Her basal metabolic rate had never risen higher than + 23. Every known test had been carried out and no useful information had been disclosed; hookworm had been excluded. The question of diagnosis had been difficult. Admittedly she had suffered from goitre, but Dr. Lidwill had never seen any patient with hyperthyroidism who had lost so much weight and associated with whose condition there had been so little nervous disturbance. The condition had appeared to him to be one of hyperthyroidism together with some endocrine disorder. All septic foci had been treated.

Subsequently Dr. Edye had removed a large portion of the goitre and since then the patient had made an uninterrupted recovery and was quite a different girl. According to the pathological report the tissue removed at operation had appeared to be the whole of the left lobe and most of the right lobe of the thyroid gland. It had weighed sixty-seven grammes and had been dark and lobulated. On section the colour had been dark amber and no adenomata had been seen. Microscopically there had been a diffuse hyperplasia throughout the tissue examined. The alveoli varied in size and shape. Some were very small and contained no colloid, some were lacunar. The cells were taller than normal; they were mostly tall and cuboidal and some were low and columnar. The colloid, though in most alveoli not very pale, manifested pronounced peripheral vacuolation. Fibrous tissue was increased, but no lymphoid increase could be found.

#### A Case for Diagnosis.

Dr. Lidwill's second patient was a labourer, aged thirty-three years, who had been admitted to hospital on June 18, 1929. He had been born in Malta and had been in Australia for seventeen years. He was temperate in all things. He complained of numbness and pains in the legs of twelve years' duration and from time to time he got blisters on his left leg and foot and these formed indolent ulcers which were punched out almost like a syphilitic ulcer. Examination revealed dried areas of skin on the right leg and a punched out ulcer on the heel. Dr. Lidwill described the formation of these ulcers as observed by himself. The skin where it was dry became blistered and a slough formed; with the separation of the slough an ulcer remained which was very difficult to heal. Over the outer side of the leg and heel where these blisters formed, anaesthesia was present. The question of diagnosis was difficult. Neither the blood nor the cerebro-spinal fluid

had reacted to the Wassermann test. Examination of the eyes revealed normal discs. No reaction had been obtained to Rubino's test for leprosy. An examination of the skin for leprosy had been without result. X ray examination of the chest had revealed no evidence of tuberculosis. On electrical examination of the right leg the response to the faradic current had been good and the cathodic closing contraction had been greater than the anodic closing contraction. No evidence of tumour had been found in the bone of the pelvis or spine and culture of the urine had failed to reveal Neisserian infection. Apart from the anaesthesia there appeared to be no other involvement of the nervous system. Dr. E. H. Molesworth and Dr. Grant Lindeman had both seen the patient with Dr. Lidwill and were unable to account for the condition. Leprosy and syphilis were both excluded and the question arose whether the patient had produced this condition by intentional trauma. Dr. Lidwill asked for an expression of opinion from those present.

Dr. R. ANGEL MONEY suggested that the condition might be diphtheritic.<sup>1</sup>

#### Encephalography.

Dr. LYLE BUCHANAN read a paper in which he discussed the technique of encephalography. He illustrated his remarks by a series of skiagrams and illustrations projected on to the screen. A paper embodying Dr. Buchanan's remarks appeared in the issue of December 7, 1929.

#### Jacksonian Epilepsy.

Dr. ALLAN S. WALKER showed a boy, aged three and a half years, who had been quite healthy until three months previously, when he had had convulsions lasting for three and a half hours. A lumbar puncture had been performed, the fluid had been clear and under slightly increased pressure, but only two cubic centimetres had been obtained. Three similar attacks had occurred and at the time of the last of these lumbar puncture had again been performed with a similar yield of two cubic centimetres of clear fluid. Dr. Walker said that Dr. E. W. Ashby who saw and treated the patient, had made accurate observations during the last attack. It had been of the Jacksonian type, beginning in the distal joint of the right thumb, spreading to the whole thumb, hand, other fingers, right arm, jaw, eyes (the right lateral rectus muscle) and the right leg. Consciousness had been lost. After recovery slight paresis of the right side had been noted and on two occasions after the attacks a trace of sugar had been found in the urine. There was no other history of importance, except that the child had had one or two falls and had bumped his head. The family history was clear.

Since the attacks had started the boy had become more mischievous. He was happy, but extremely restless and destructive. His intellectual condition on the whole was good, but definitely suggested either some degree of retardation of development or recent mental reduction.

When Dr. Walker had first seen the patient one month previously, he had manifested no definite abnormality. His gait had been rather waddling in type and it had appeared that he tended to throw the right leg rather widely outwards. X ray examination of the skull had revealed no abnormality and the fundi were normal. His head appeared to be large for his age. In hospital lumbar puncture had yielded readily ten cubic centimetres of fluid; the fluid had contained twenty-five cells per cubic millimetre and, like the blood, had not reacted to the Wassermann test.

A week prior to the meeting the patient had suddenly had a series of severe and prolonged fits. Lumbar puncture had again been carried out, but had yielded only five cubic centimetres of fluid which was not under increased pressure. The fits had been of a generalized tonic and clonic type, beginning and being more severe in the left arm and leg. For some hours the child had twitched and had been unconscious and the left limbs had been definitely paretic. For twenty-four hours afterwards he had been drowsy and had looked white and shaken. He had gradually recovered, but for some days had been very subdued.

Dr. Walker said that the points of interest in the case were four in number. In the first place there was the

apparent localization in the earlier fits which was contradicted in the last series of fits. The second point was the small amount of cerebro-spinal fluid obtainable during the attacks. In the third place there was evidence of mental reduction which was characteristic of the increased intracranial pressure of internal hydrocephalus. Fourthly, there was the serious check on metabolic well being imposed by cerebral disturbances. The last was a commonplace, but the physical upset after fits might well be linked up with the wasting seen in association with cerebral tumours and abscesses. It would seem likely that the patient's epilepsy was due to a definite organic cause producing intermittent hydrocephalus. If the presence of a block in the ventricular system was assumed, where was the block? There had been nothing suggesting a fourth ventricular syndrome and the motor symptoms might readily follow a lesion higher up. If the patient had further fits, Dr. Walker would certainly puncture the *cisterna magna* and in any case he would probably carry out a Queckenstedt test with a needle in that site. It scarcely seemed justifiable to carry out a ventriculography examination in view of the age of the patient and the difficulties of such a procedure under anaesthesia. Ventricular estimation seemed unlikely to yield information. He thought that further investigation should be governed by the practical consideration of its likelihood to afford indications for treatment and not merely give opportunity for the gratification of an academic curiosity.

#### Hysterical Hyperpnoea.

Dr. COTTER HARVEY showed a single girl, aged twenty years, who had been admitted to the Royal Prince Alfred Hospital on July 26, 1929. The patient had complained of severe pain in the left side of the chest for three months; the pain had resisted all treatment. The medical attendant, having made a diagnosis of pleurisy, had asked in despair whether artificial pneumothorax might be produced in order to relieve the pain. Inquiry on admission had revealed the fact that the patient had been treated for hysterical monoplegia and again for hysteria in the Royal Prince Alfred Hospital three months previously. She had had lobar pneumonia on the left side and this had been followed by intermittent pain.

On examination the patient had been found sitting up in bed and breathing rapidly. No friction sound had been discovered and no abnormal pulmonary signs were present. X ray examination of the chest had revealed no abnormality. At the time of the meeting the patient still had pain in her left side and the respiration rate varied from 80 to 90 in the minute. This had been the rate for the previous two weeks. The patient appeared to be quite comfortable, but the respiratory rate did not vary greatly even when she was speaking. It had been noted, however, that during sleep the rate was only 20 in the minute.

Dr. Harvey said that the points of interest were several in number. In the first place there was the extraordinarily rapid and persistent respiration rate which did not appear to fatigue or to distress the patient in the least. In the second place the patient had been admitted to hospital for the third time in six years and had on each occasion successfully deceived her medical advisers. On the first occasion the provisional diagnosis had been acute rheumatism. Four years later she had gained admission under the care of an orthopaedic surgeon with a diagnosis of paralysis of the leg. On this occasion she had worried her family medical attendant exceedingly and he had confessed to having gone to her aid several times in the middle of the night to relieve her intolerable pain.

A MEETING of members of the Victorian Branch of the British Medical Association interested in the formation of a section of anaesthetics was held in the Medical Society Hall, East Melbourne, on November 21, 1929. Dr. F. W. GREEN convened the meeting.

It was resolved by the twenty members present that a section be formed. Dr. R. W. HOENABROOK was elected the president.

It was further resolved that quarterly meetings should be held and that the first should take place in the evening

<sup>1</sup> On subsequent examination no Klebs-Löffler bacilli were found.

of the third Thursday in January, 1930. The annual subscription to the section was fixed at five shillings. All those interested in anaesthesia were invited to communicate with the Honorary Secretary, Dr. Eric Gaudevia, 186, Gipps Street, Abbotsford, Victoria. It is assumed that the sanction for the formation of the section will be given by the Council of the Victorian Branch.

#### MEDICO-POLITICAL.

At a meeting of the New South Wales Branch of the British Medical Association, held on October 31, 1929, at 21, Elizabeth Street, Sydney, Dr. F. BROWN CRAIG, the President, announced that two nominations of candidates for election as members of the Federal Committee of the British Medical Association in Australia to represent the New South Wales Branch had been received. He therefore declared Dr. R. H. Todd and Dr. J. Adam Dick, C.M.G., duly elected members of the Federal Committee for the year 1930.

#### Obituary.

##### PERCY NORMAN AIKEN.

We regret to announce the death of Dr. Percy Norman Aiken which occurred at Sydney on December 11, 1929.

##### FRANCIS JOHN DRAKE.

We regret to announce the death of Dr. Francis John Drake which occurred at Mont Albert, Victoria, on December 17, 1929.

##### THOMAS WILLIAM WATKINS BURGESS.

We regret to announce the death of Dr. Thomas William Watkins Burgess which occurred at Sydney on December 24, 1929.

#### Books Received.

THE PRINCIPLES OF BACTERIOLOGY AND IMMUNITY, by W. W. C. Topley, M.A., M.D., M.Sc., F.R.C.P., and G. S. Wilson, M.D., M.R.C.P., D.P.H.; Volume I; 1929. London: Edward Arnold and Company. Royal 8vo., pp. 619, with illustrations.

#### Diary for the Month.

- JAN. 7.—New South Wales Branch, B.M.A.: Council.  
 JAN. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 JAN. 9.—South Australian Branch, B.M.A.: Council.  
 JAN. 14.—New South Wales Branch, B.M.A.: Ethics Committee.  
 JAN. 14.—New South Wales Branch, B.M.A.: Post-Graduate Work Committee.  
 JAN. 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 JAN. 22.—Victorian Branch, B.M.A.: Council.  
 JAN. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.

#### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii.

ALFRED HOSPITAL, MELBOURNE: Medical Superintendent.  
 ISISFORD DISTRICT HOSPITAL, QUEENSLAND: Medical Officer.  
 MELBOURNE HOSPITAL, VICTORIA: Physician, Surgeon.  
 ROCKHAMPTON HOSPITALS BOARD: Resident Medical Officer.  
 SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Clinical Assistant.  
 THE BRISBANE AND SOUTH COAST HOSPITALS BOARD: Honorary Ear, Nose and Throat Surgeon.

#### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

#### Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2451-2.)

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